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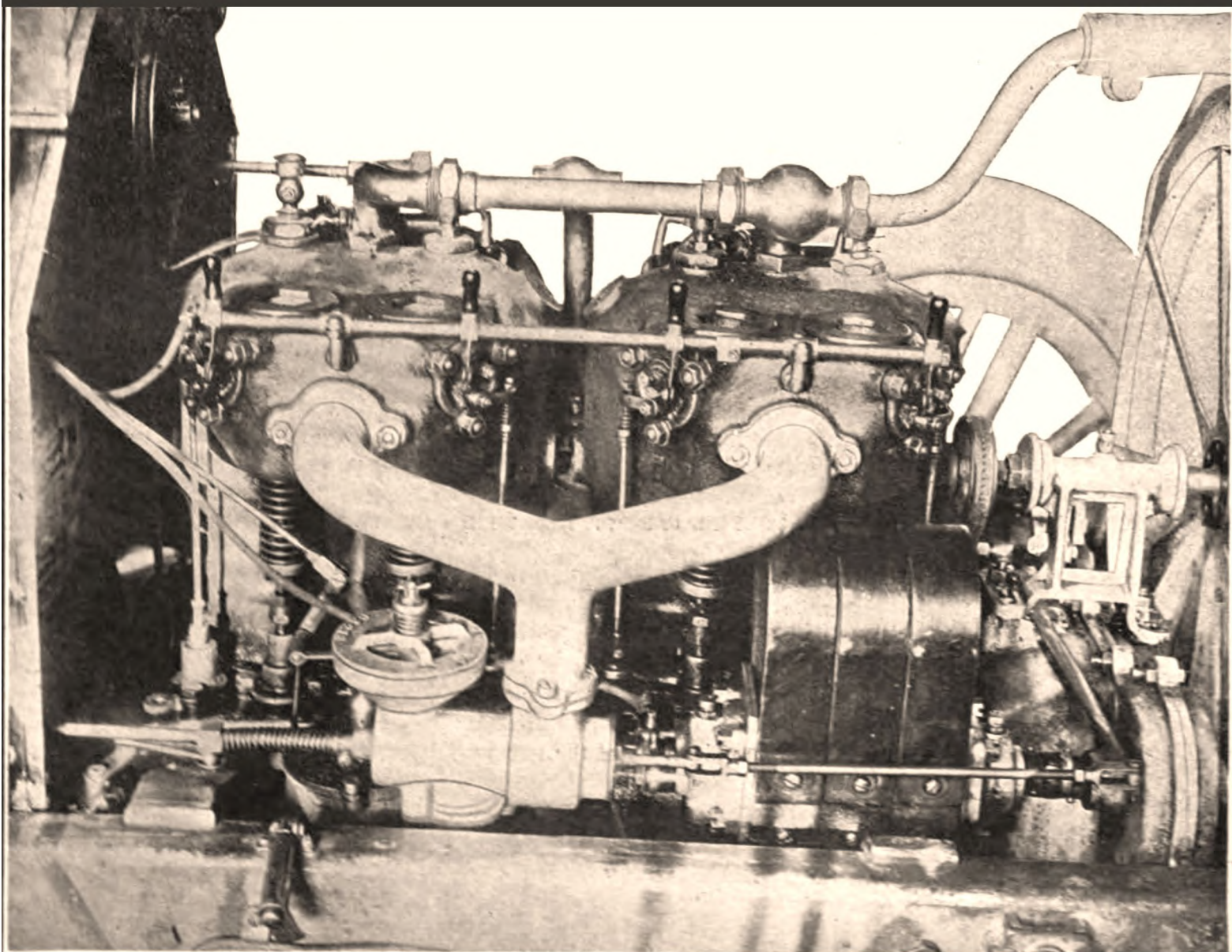
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THE AUTOMOBILE

VOL. XIV.

NEW YORK—THURSDAY, JANUARY 4, 1906—CHICAGO

No. 1

WOLSELEY 140-H.P. RAILROAD CAR MOTOR.

THE engine illustrated on this page is the six-cylinder horizontal opposed Wolseley motor built for

led in an experimental self-propelled coach at the
y, N. Y. There are a number of interesting features
English ideas in a prime mover for self-propelled rail-
is originally placed with the Birmingham concern
d guarantee prompt delivery of a motor suited to
concern had successfully built explosion motors for
rd. The motor here described is used to drive a
ur to that employed on the English railroad referred
sepower at 420 revolutions, and the weight scales at
Wolseley Company has long been the exponent of
e almost exclusively in their touring cars until
doubtless a determining factor in employing it in
1) shows a compact and clean design in which there
anlike assemblage of piping and connections.
n in the sectioned drawing. The motor was built
ler the builder's trials using gasoline as fuel, the
or three hours was thirty-three gallons; the average
ng a fuel consumption of .607 of a pint per horse-
ded during the test was 158.24. Frequent readings

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5, 2, 8, 9-14-15
which ~~are~~ are unavailable.



OF THE
perature of
the cooling
water
showed

that it remained practically constant at 45 degrees Centigrade.

The engine has six opposed cylinders, three on a side, each cylinder of 9 inches bore and 10 inches stroke. The cylinder castings extend into the crank hamber just clear of the tops of the connecting rod big ends, giving a long trunk bearing for the pistons, which are each fitted with three square section rings. It will be noticed that the cylinder proper is really a liner, seating in the enclosing water jacket in metal-to-metal joints.

The connecting rods are of I section, with marine crank pin ends and round forged wrist pin ends. The valves are located in a concentric combustion chamber in the deep cylinder heads, two inlet and two exhaust valves to each cylinder, all mechanically operated. Camshafts, operated by gears in the usual way, extend lengthwise of the engine on the sides below the cylinders and inside the crankcase. The cams impart

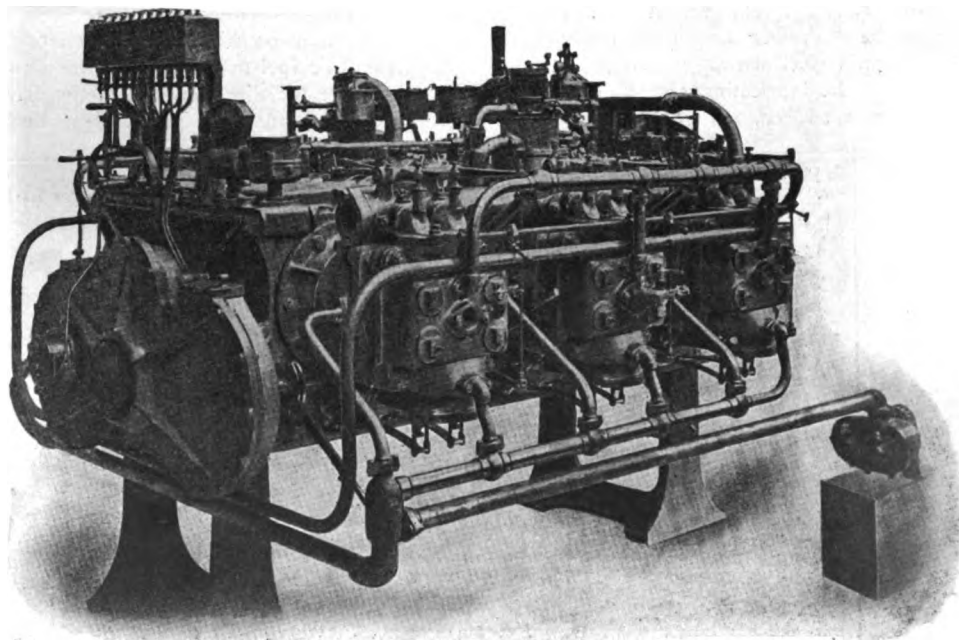


FIG. 1.—WOLSELEY 140-H.P. MOTOR BUILT FOR GENERAL ELECTRIC CO., SCHENECTADY, N. Y.

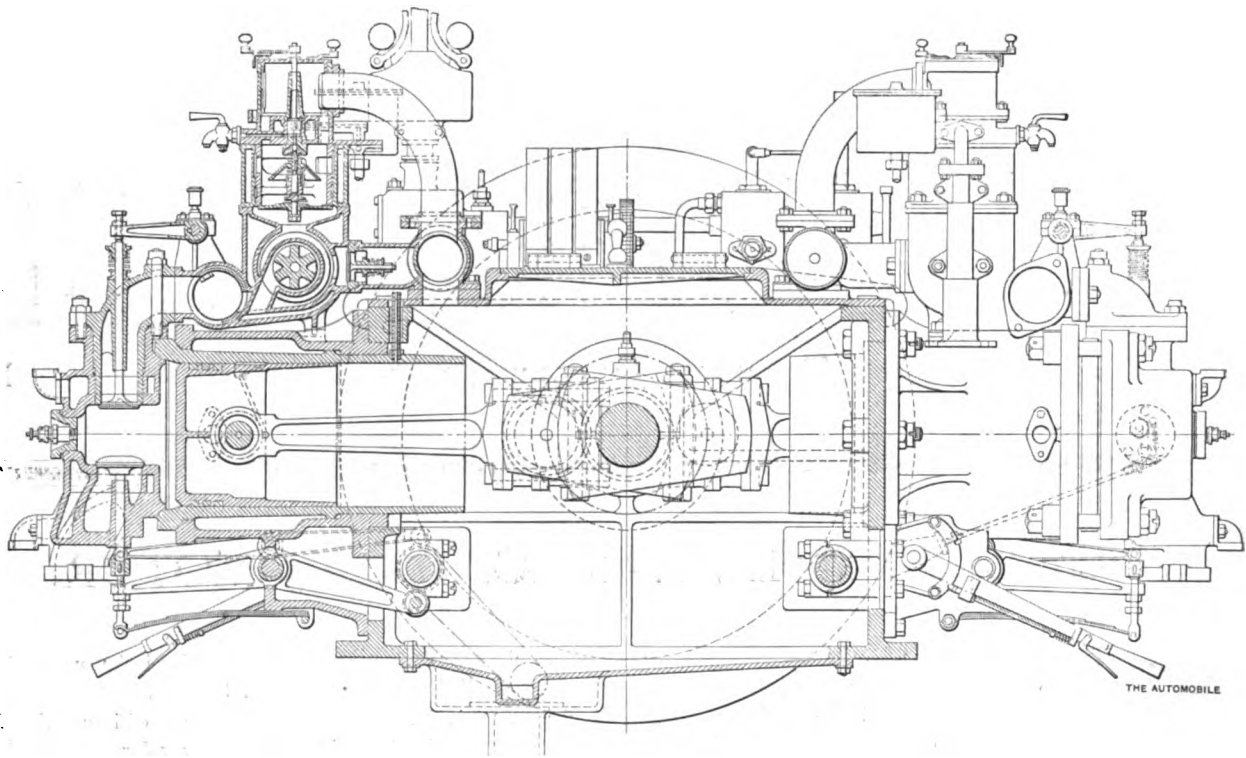


FIG. 2.—TRANSVERSE VIEW OF THE 140-HORSEPOWER 6-CYLINDER OPPOSED WOLSELEY MOTOR, PARTLY IN SECTION.

motion to the rocking levers pivoted below the cylinders, the outer ends operating the top row of inlet valves (by pullrods connected to single arm levers above the valves), and the bottom row of exhaust valves by contact with a stirrup attached to the valve stems. This arrangement can be clearly seen on inspection of Fig. 2. The inlet valves are held on their seats by ordinary coil springs and the exhaust valves by heavy, laminated flat steel springs. Special structural materials are used throughout; the pistons and connecting rods are of tough steel, the crankshaft of high-grade Sheffield steel, the bearings of phosphor bronze, inlet valves of mild steel, and exhaust valves having cast-iron heads and mild steel stems.

The lubricating system is very carefully worked out, as would be expected in a

heavy engine of this type. All the pistons and main bearings are oiled by pressure feed from gear-driven pumps at the fly-wheel end of the motor. These pumps draw their supply from the bottom of the crankcase. The rate of flow of the oil to these frictional surfaces is therefore directly proportioned to the speed of the motor. A supplementary system furnishes a drip feed oil supply to the crank pins and all other bearings.

Two carbureters are mounted on the engine, one at each side supplying three cylinders. Two float feed chambers are fitted for each carbureter, one for gasoline and one for kerosene, a three-way cock in the connections permitting an immediate change from one fuel to the other. The air supply is under the direct control of the driver by suitable connections, and this can be drawn

either from the crank chamber or from the outside air. The intention of the builders is to usually draw the air supply from the chamber so as to rid it of accumulations of gas and assist in keeping the main bearings cool. Just how this works out in practice we do not know, but it would seem that this method would give a poor mixture in the engine cylinders. A throttle of the rotary type in the induction pipe is controlled by the engine governor, and regulates the volume of fuel.

In a motor of the dimensions of this one some provision must be made for starting other than manually. This is usually done by the aid of a compressed air attachment. In the Wolseley motor the initial turning movement is obtained by the explosion of a gunpowder cartridge in one or more of the cylinders. In the end of the combus-

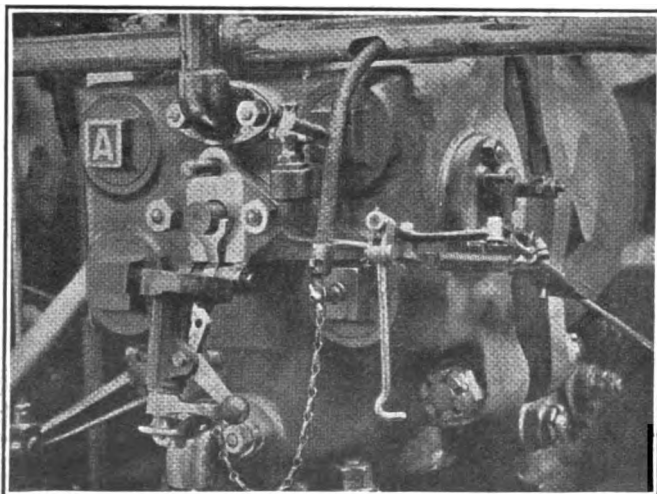


FIG. 3.—STARTING CARTRIDGE INSERTED IN SPARK PLUG OPENING IN COMBUSTION CHAMBER ON CYLINDER HEAD.

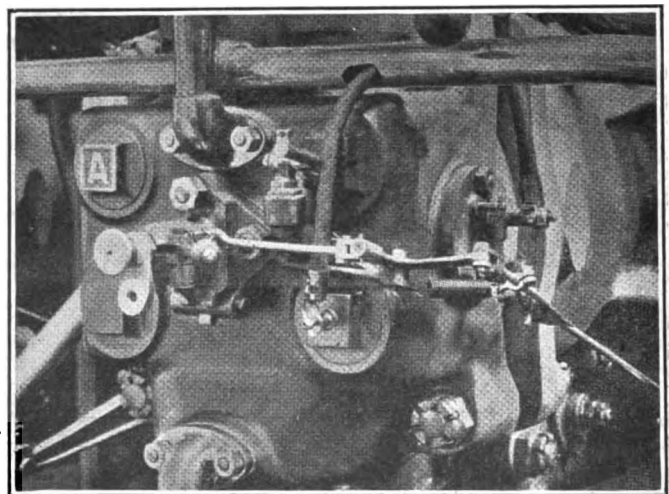


FIG. 4.—BREECH BLOCK CLOSED OVER STARTING CARTRIDGE AND TRIGGER CONNECTIONS IN POSITION.

tion chamber (which is practically the cylinder head) there is a hole for the insertion of the high-tension spark plug, and surrounding this hole, on the outside, is an extension of the casting having a rectangular face. In this hole, when the spark plug and its casing is removed, the powder cartridge can be snugly fitted, the head resting on a hinged extractor, which is clearly shown in Fig. 3. A device known in gun-making as a "breech block," is hinged to the rearward of the extractor and contains the firing pin. After the cartridge is inserted the breech block is swung upward and locked in place by a nut on a suitable stud. This position is seen in Fig. 4. The striker is cocked and held ready to fire by a trigger which is connected by rods and links to the low-tension ignition tappet rods, by which it is tripped—the motor is fitted with double ignition. Usually three cylinders are so

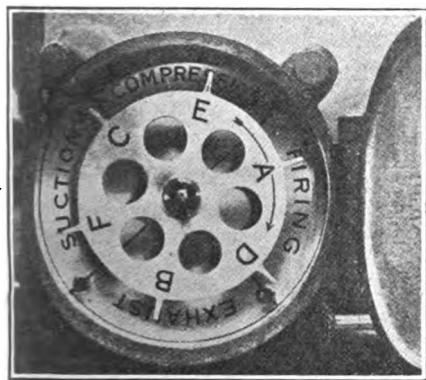


Fig. 5.—Indicator Showing Condition of Cycle in All of the Cylinders.

"loaded," and the first is fired by hand, the two others going off automatically as the low-tension apparatus commences to function.

The cartridge is an ordinary metallic blank filled with 300 grains of black powder, giving a pressure on ignition equal to about one-half the working pressure in the cylinder. The explosion is not supplemental to the ignition of a regular gas charge in the cylinder, as before firing the exhaust valve of the cylinder is lifted by hand, allowing the contained pressure (if any) to fall to atmospheric. After the motor is running the breech block and cartridge case can be removed and the former replaced by a hinged casting which carries the regular spark plug.

It will at once be seen that the driver must know which of the cylinders is ready for firing before he loads it with the cartridge or else a back kick would be as likely as not to happen. For this purpose a mechanical indicator is fitted to the motor, showing at a glance the condition of the cycle of operations in each cylinder. The face of the indicator is seen in Fig. 5. Each letter on its face corresponds with a similar letter stamped on a plug in the cylinder head. If it should happen that no piston was in the correct position for firing, the

motor would be pinched around until one of the cranks stood at about 20 degrees past center on the explosion stroke.

The starting cartridges need not be removed if the motor is run on the low-tension ignition system, as of course they are gas-tight after they are locked in place and fired. When the motor was built a good deal of experimentation was carried on to discover any weakness in this starting system. The builders state that there was not a single case of failure to start. The system takes longer to describe than to actually operate.

We understand that the motor has been very thoroughly tested by the General Electric Company, and has been found highly efficient. The workmanship is very fine, and the design apparently the result of much experience in explosion engine work. No doubt later some public demonstration of the mixed system adopted by the General Electric Company will be made. It is the intention to couple the engine direct to a generator furnishing current to the car electric motors. Its performance on the rails will be watched with interest by automobile engineers.

British Railroad Automobiles, and Motor 'Buses Used as Steam Road Feeders.

LONDON, Dec. 5. — Recognizing that the general adoption of automobiles and motor trucks is only a question of time, the British railway companies have overcome their feeling of opposition and are now running automobiles of their own. Naturally enough, the adoption of any innovation of this sort takes time, for extensive trials of the value and practicability of the new idea must be made, but now the period of probation is passed, and in a very short time the automobile department will be an acknowledged branch of the railway organization. Automobiles for this work fall naturally into two classes: those used on rails and supplementing or replacing the ordinary trains, and those running on the public roads and acting as feeders to the railway.

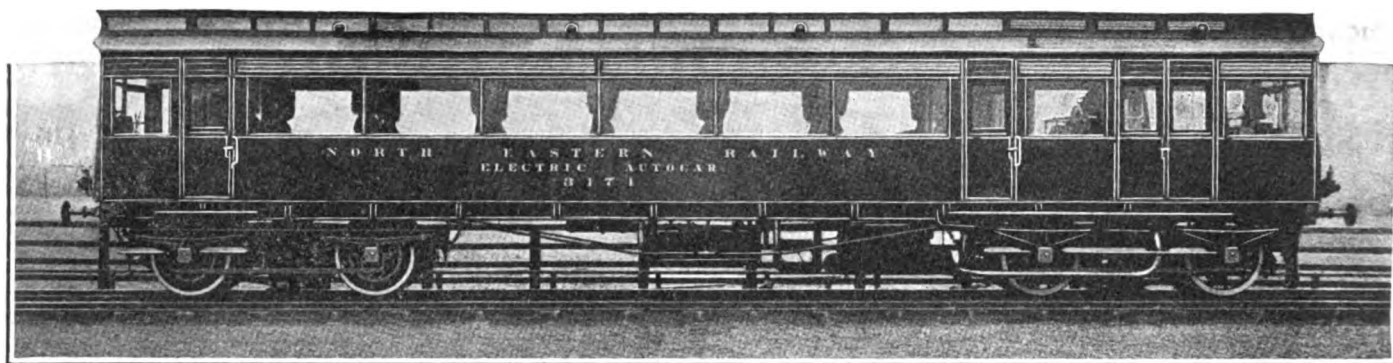
AUTOMOBILE CARS ON BRANCH LINES.

The first of these two classes has a wide scope for operations. In every railway system there are always branch lines on which there is but a small traffic that does not pay for the existing steam service, but to en-

courage development of the traffic the management may decide to run a frequent service of trains and the receipts may be altogether disproportionate to the running expenses. Here the railway automobile enters and exactly fulfills the requirements. Small auto coaches—with or without a trailer, according to fluctuations of traffic—can be run on the same schedule as the steam train at a greatly reduced cost, and yet be all that can be desired as regards carrying capacity and speed. The old train required a heavy engine—heavy because it is not worth building specially light engines for this light traffic—and generally three or four coaches to insure steadiness. The locomotive is not economical for light loads, and even when not actually running is consuming fuel. On the other hand, the automobile car is compact and light in weight; generally the driver can dispense with the assistance of a fireman, and if the coach has a gasoline engine no fuel is being consumed except when running. Being light, and easily slowed down and accelerated, frequent stops



DOUBLE-DECKED GASOLINE OMNIBUS, USED BY GREAT WESTERN RAILWAY OF ENGLAND.



GASOLINE-ELECTRIC RAILROAD MOTOR CAR, EQUIPPED BY WOLSELEY FIRM FOR THE NORTH EASTERN RAILWAY OF ENGLAND.

can be made economically and passengers can be picked up at other points than the regular stopping stations. In many other details the railway automobile surpasses its rival, and without doubt the new method will be soon in general use on branch lines with light traffic.

GREAT WESTERN STEAM COACHES.

As regards motive power for these cars, the railway companies naturally incline towards the use of steam, and most of the carriages already built in England use this for propulsion. Many of the English railways are now experimenting with various types of carriages. Perhaps the Great Western Railway Company has made the most progress. This company has already almost thirty automobile services in operation, mostly on branch lines, and many more are in contemplation.

The cars are built at the company's works at Swindon, and the two classes are known as "suburban" and "branch" carriages. The "suburban" carriages are designed to serve urban districts, in which provision has to be made for a large population, and where the journeys are generally of short duration. The carriages are fifty-nine and seventy feet in length, with the motor compartment occupying the first fourteen feet and the remainder divided into compartments for smoking, and non-smoking passengers. There is accommodation for fifty passengers, and no distinction of class is made. The power plant of the carriage is amply powerful for hauling two, or even three, trailers in case of sudden increase of traffic. Vestibule doors at the ends give access to the interior, and the seats are placed crossways in sets of three. Motive power is provided by a steam engine with two horizontal cylinders, 12 by 16 inches, supplied from a vertical multitubular boiler. Hand and vacuum brakes are fitted, and these, together with the engine, can be controlled from either end of the car; in fact, on the latest models with trailers, control can be effected from the trailer, thus retaining all the advantages of a single vehicle.

The "branch" carriages are intended for longer distances and are made larger and more comfortable inside. Distinction is made between first and second-class passengers, with accommodation for about forty of each. The usual fares charged are the same as on the main lines: two pence per mile

first class, and one penny (two cents) per mile second class.

NORTH EASTERN'S GASOLINE CARS.

There seems likely to be an advance in popularity of gasoline-driven railroad cars, although not much has been done in this direction as yet. The North Eastern Railway Company has now been running for more than a year a carriage of the gasoline-electric type with great success. A four-cylinder horizontal Wolseley engine of 80 horsepower is employed, and this is coupled direct to a dynamo. The current from the dynamo drives two electric motors geared direct to the front wheels. A speed of about thirty-five miles an hour is attained, and although the indirect means of driving may not be so economical of power as a steam or gasoline motor driving direct, this method results in great smoothness of running and ease of starting. When the carriage stops the engine is kept running to charge up the storage cells used for lighting up at night. [This car was illustrated and described in *THE AUTOMOBILE* of April 30, 1904.—Ed.]

GREAT NORTHERN TYPE.

Another type, which more closely follows accepted automobile design, is in use on the Great Northern Railway, near Hertford. Two engines—36-horsepower four-cylinder Daimlers—are fitted, and these drive through a gear box with sliding gears to the rear axle. This arrangement seems to give entire satisfaction, and will, no doubt, be adopted on other lines.

AUTO 'BUSES AS RAILROAD FEEDERS.

Turning now to the second class of railway automobiles, we come to what is more nearly the actual province of the automobile. As feeders to railways, the automobiles—known here generally as motor 'buses—have a wide sphere of usefulness, and their adoption has been very general and extensive during the past year. These services, which, by the way, are greatly appreciated by the residents of the districts served, afford vastly improved facilities for travel in places where even a light railroad would not be worth constructing. The thickly-populated districts of England have begun to be overrun with town-to-town electric car services (there are hundreds of miles of these in South Lancashire alone) which monopolize the greater portion of the highways and disfigure the face of the country with rails and

unsightly overhead wires. If the motor 'bus does nothing more than check this growing nuisance, it will have conferred a favor upon civilization.

The 'buses used for these 'bus lines are of many types, and are in general propelled by gasoline motors. The principal exception is the Clarkson, which has a steam engine supplied from a kerosene-fired flash boiler. The noiselessness and ease of starting of these vehicles is greatly in their favor, but as the gasoline cars are improved they will tend to rival the steam car in these particulars.

TYPES OF GASOLINE 'BUSES.

The gasoline auto 'buses have, in general, a four-cylinder 20-30-horsepower engine, running at about 1,200 revolutions per minute, and have four speeds and reverse, turning the drive wheels by either shaft or chains, the former method being perhaps the more common. Two types of ignition—magneto low tension and high tension with coil and battery—are used in conjunction to avoid chance of delay through ignition troubles. Solid rubber tires are usual on all wheels, and the makers of these tires seem able now to make an article that is fairly reliable and satisfactory.

The bodies, of course, vary greatly, but the usual type is double decked, seating about sixteen inside and eighteen outside, besides driver and conductor. Provision is also made on some for carrying goods and mails. The average rate of travel is twelve miles an hour, and the 'buses are run on a regular schedule, generally in conjunction with the arrival and departure of trains. About eighty to 100 miles is the daily mileage for one of these 'buses, and the total running cost, including tires and renewals, is about nine pence to eleven pence (eighteen to twenty cents).

Such vehicles as these have been running continuously for a year or more and no vital replacements are yet necessary. As to their utility and commercial success, there is no question; the enormous growth in their use that has been noted in the past few months testifies to the great future before the railway automobile.

"It takes a lot of patience to run an automobile, does it not?" asked the man. "Yes, lots of patients," replied the doctor; "and I've got 'em."—*Yonkers Statesman*.

Chicago & Alton Making Tests.

CHICAGO, Dec. 30.—The Chicago & Alton Railroad Company made a thorough test of a gasoline railroad car on Wednesday and the results were so satisfactory that the officials intend to use this type of a car for suburban service between various points in the state for the purpose of competing with the electric lines.

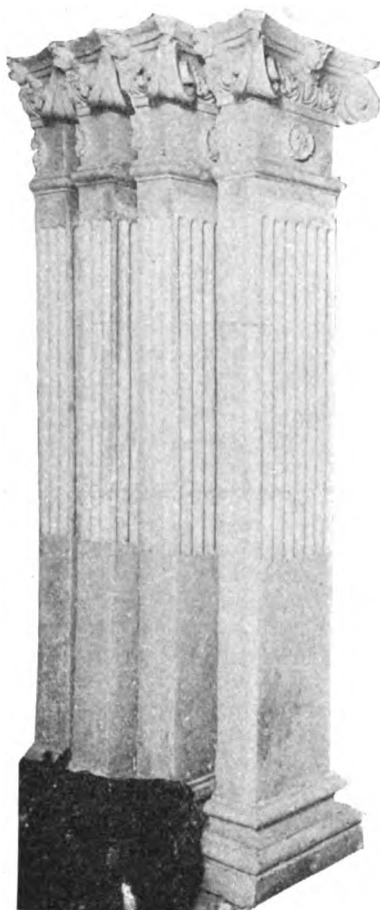
In the test, during which the car was run from Jacksonville to Alton, Ill., a distance of sixty-six miles, a speed of forty-five miles an hour was attained. The car was loaded to its capacity. Several similar cars will be ordered and will replace the steam trains in the interurban service between Springfield and Carlinville, Springfield and Lincoln, and Bloomington and Pontiac, in Illinois.

The Chicago & Alton company had previously experimented with light trains hauled by small steam engines, but they did not fully meet the requirements of the situation. Believing that a car propelled by gasoline would probably meet the need for short trips at high speed with numerous stops, a special type of a motor car was designed and constructed. This was the car which went through the test on Wednesday.

It is built of steel, which safeguards the passengers, especially against telescoping. Its lines resemble those of an inverted boat, the roof being rounded and the car tapering to a sharp edge in front and being rounded off at the rear, to reduce wind resistance and dragging suction. The construction is very similar to that of the Union Pacific motor cars. In weight it is 56,000 pounds and the car will accommodate fifty-seven persons. There are two four-wheel steel trucks—the driving wheels being 42 inches in diameter and the others 34. The car is fifty-five feet in length.

The engine, which is a 100-horsepower, six-cylinder gasoline engine, built on special railroad patterns, is cooled by water circulation with coils. It has a make-and-break spark ignition, with a primary battery for starting and a magneto for running service. The air-brake valve lever and the emerg-

ency spark cut-off enable the driver to stop the engine and put on the full brake power in half a second. Eight cells of battery supply the spark current. The engine drives to the axle by means of a special chain.



STAFF PILASTERS FOR THE GARDEN SHOW.

The car can start on high speed, direct connected, without the use of gears, on the level or on a grade of 1-2 per cent. On steeper grades the speed gears are used. A muffler silences the exhaust.

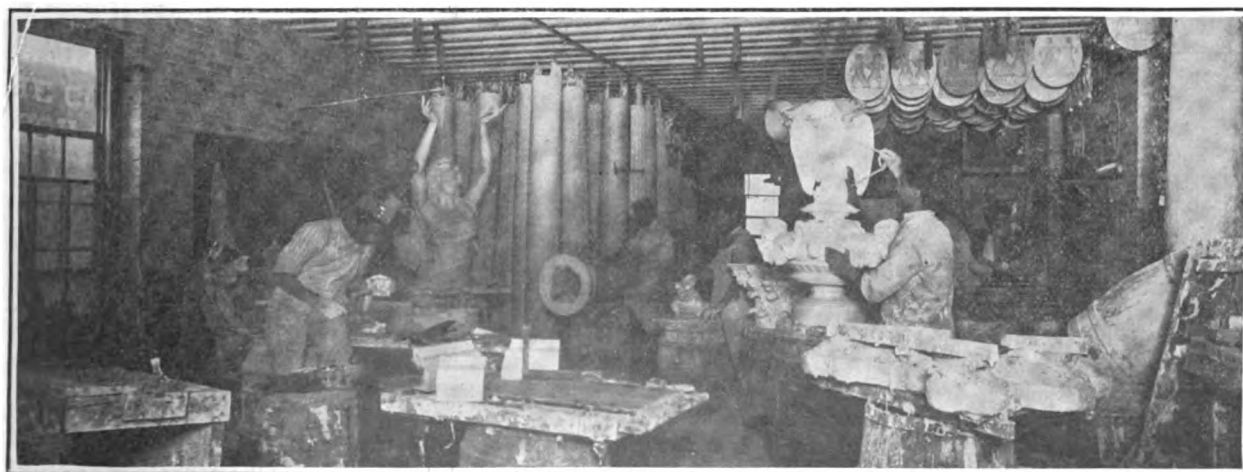
Many foreign chassis are now being offered abroad with either long or short wheelbase, and frequently the purchaser is given an option on chain or shaft drive.

Preparing for Show Opening.

Preparations for the Madison Square Garden Automobile Show are already well under way, and much actual work has been done, notwithstanding the fact that the great building is now the scene of a poultry show and that the automobile show will not be opened until January 13. A great deal of the decorative material, such as the staff work, is being prepared in studios, and when the decorators take possession of the building, probably on Monday, January 8, there will be an abundance of material ready to put in place. The time between that date and the opening of the show will be none too long to complete all the details of the elaborate decorative scheme. A description of the plans for decoration was given in THE AUTOMOBILE for December 14; the illustrations given herewith give an idea of how the work is being done and what some of the details will look like. It is evident that those to whom an automobile show in Madison Square Garden has become a familiar scene will find a very different Garden for the 1906 show.

Practical demonstrations of cars will be an important feature of the show of the Automobile Club of America in the new armory of the Sixty-ninth Regiment, on Twenty-sixth street, near Fourth avenue, New York; manufacturers are arranging for a great deal of work of this kind, realizing that actual work is the real test of the car. Work on the building has progressed with such rapidity that exhibitors will be admitted to commence preparations on Wednesday, January 10, instead of on the following day, and will be required to have their work completed and exhibits in place by 1 o'clock p. m. Saturday, January 13, in order to allow time for a final cleaning up and for a private view by club members and their guests before the show is opened to the public at 8 o'clock p. m. Decorations will be confined to the stands, the promoters believing that the public will desire to see the architectural features of the splendid new building. The stands, however, will be most harmoniously decorated.

(Continued on page 21.)



ARTISTS WORKING ON STAFF DECORATIONS FOR MADISON SQUARE GARDEN SHOW.

1906 MODELS AT THE PARIS SALON.—II.

By RENE M. PETARD.

DARRACQ'S extensive and largely extended stand contains as its most noteworthy exhibit Hemery's winning racer, and a polished chassis, in which very few changes have taken place since last year. In fact, the only changes made are betterment of details going towards simplification in manufacture and increase in strength without affecting in any way the general factory routine.

A clever fan belt tightener is shown in Fig. 1, in which the fan spindle *S* is eccentrically formed on a hexagon disc *D* integral with a large diameter screw *V*, which is hollowed out for lightness. This screws into a box *B* carried in front of the engine in a permanent position. By screwing *V* in and out of *B* the disc *D* rotates and spindle *S* is brought nearer or further apart from the crankshaft which carries the driving pulley, thus tightening or loosening the belt, as may be desired. A locknut *L*, which rests against the box *B*, is used to secure the screw in its desired position.

The frame of the 1906 car is raised at the rear and at the same time bent inwards, so

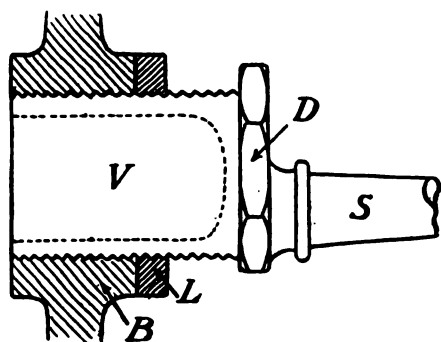


Fig. 1.—Darracq Fan Belt Tightener.

as to allow the machine to stand very low on the ground. Double ignition is fitted as a standard to all models above 40 horsepower, the latter included.

In the models exhibited by the old house of Peugeot, the engine is found to be quite low in the frame, the valves being symmetrically placed on each side of the cylinders and their pipe connections being carefully thought out to insure efficiency and ease of access to all parts of the motor. The new Peugeot carbureter is fitted, which, although on much the same principle as that of last year, is considerably simplified. No heat is supplied to this carbureter either by the exhaust or the water circulation, the same being the case with the Renault apparatus described in the previous article. In the Peugeot carbureter (Fig. 2) a large chamber *A* is formed which freely communicates with the warm atmosphere under the bon-

net. By means of large holes, a valve *V* riveted on a stem *T* rests against a projecting edge *E* between this chamber *A* and the mixing chamber *M*, a spring *S* keeps this valve normally in contact with its seat. The other end of the stem *T* carries a piston *P* working in a cylinder *D* formed in the carbureter casting, the space between this piston and the bottom of the casting form-

with the throttle. The object in thus regulating the delivery of the fuel as well as the air is the same as that mentioned when describing the Renault connections on the mixture delivering system; viz., to correct the imperfections of any automatic carbureter purely based upon suction phenomena.

The Peugeot machine as a whole is very carefully thought out and the entire system

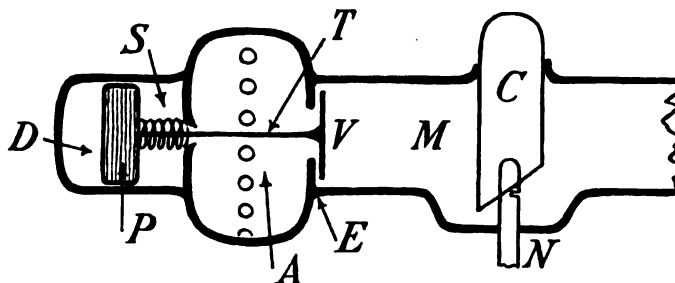


Fig. 2.—Rough Sketch Peugeot Carbureter.

ing a dashpot intended to prevent the sudden fluctuations of valve *V*. The nozzle *N* stands vertically a little distance from *V* in the mixing chamber. This nozzle is of a rather peculiar shape and consists of a piece of bronze of the shape shown in Fig. 3, bored out centrally almost up to its top and slotted on the side as shown at *F*; of course, the sketch is very much magnified. The slot *F* consequently forms the outlet for the spray of liquid fuel caused by the suction of the motor. A cap *C* (Fig. 2) is fitted in a slide above the nozzle, and has its lower end cut down at an angle. This cap is almost a fit over the nozzle, although its size is exaggerated for clearness in the sketch. When the motor is running the valve *V* is opened to a certain extent by the suction, this opening varying with the speed of the motor; thus the quantity of air supplied is regulated. The cap over the nozzle

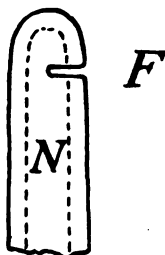


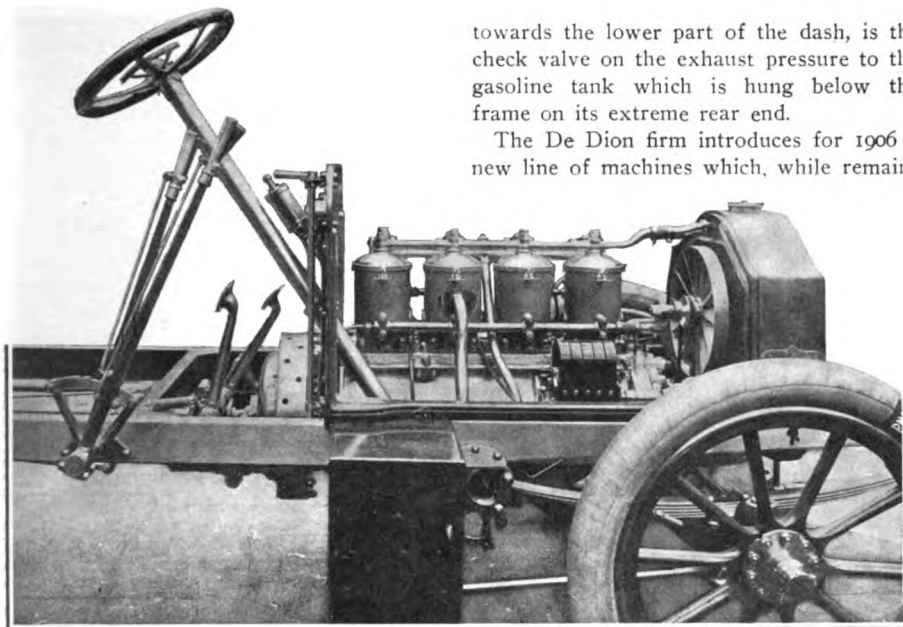
Fig. 3.—Peugeot Nozzle, Exaggerated in Size.

is slidably mounted over the nozzle, as was already stated, so that by connection with the throttle, if the latter is altered in its setting, the cap will either go up or down over the nozzle and thus its leveled end will cover up more or less of the spraying slot. Suitable links are used to connect cap *C*

is of great strength. The sub-frame, which carries the engine and gear box, is hung from both ends to cross members on the frame, while a sheet steel web comes down from the frame sides to the sub-frame on its entire length, reinforcing both the frame and sub-frame and affording protection for the machinery. The drive on the large machines is by chain, the differential and bevel gears system is well designed, bearings being provided on both sides of every bevel wheel. Ball bearings are used throughout except in the engine.

Passing to the firm of De Dietrich, we find on this stand a chassis that in its general lines has not been much altered from last year except that the engine is an entirely new one with this concern. It has four cylinders, cast in pairs, but instead of having the inlet valves on top and operated by overhead tappets, as was the case last year, the eight valves have been brought to the same side of the engine and are all operated directly by a single camshaft driven by inclosed gears in front of the engine. This method of placing the valves is very advantageous when cost of construction is considered, but to the user it frequently presents the disadvantage of making the motor inaccessible on the valve side. The array of pipes which it makes necessary on the valve side covers usually covers almost completely the valve stems and springs, making a repair a difficult as well as a hot job, around the exhaust pipes, when the motor has been running.

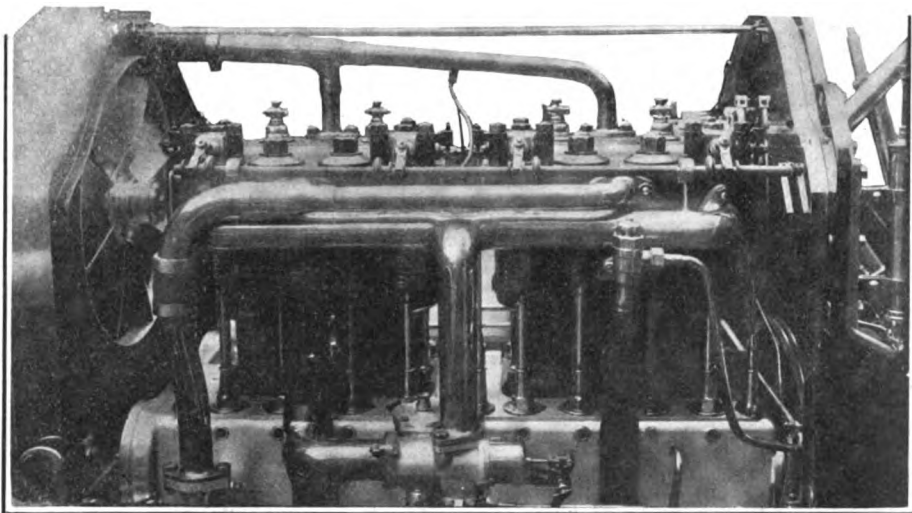
In the De Dietrich engine, however, this trouble has been practically eliminated in a highly skillful manner, the arrangement of piping, as shown in the photograph on page



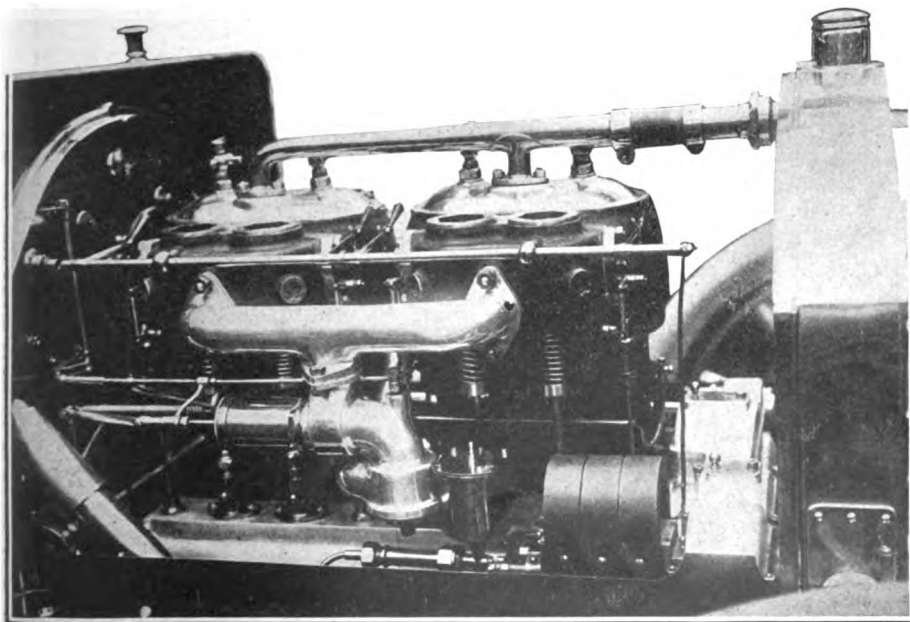
MOTOR END OF FOUR-CYLINDER DE DION CHASSIS AT PARIS SHOW.

7. being extremely neat and simple. The exhaust is led straight down from the central pair of valves of each cylinder casting, while the inlet pipe, which leads to the other four openings, is quite high near the top of the motor, and entirely out of the way, the water inlet pipe being right above it and delivering its coolest water just upon the exhaust valves chambers, where it is most needed. The pump being of very large size, the exhaust is always relatively cool and the motor is quite silent when running.

Ignition is by a high-tension magneto as a standard, but double ignition can be fitted if desired. The heat for the working of the carburetor is taken from the outside of the forward exhaust by the air inlet pipe to the carburetor. The small appliance shown in the photo on the side of the rear pair of cylinders, and fitted with a pipe leading



DE DIETRICH MOTOR VALVE SIDE.—NOTE THE CLEAN LAYOUT OF PIPING WITH ALL VALVES ON THE SAME SIDE.



INLET SIDE OF DARRACQ MOTOR, SHOWING CARBURETOR, MAGNETO AND LOW TENSION IGNITION MECHANISM.

ing much within the same powers as formerly, however, presents a number of interesting novelties. Their efforts have been towards maintaining their reputation as to simplicity and ease of upkeep, while nevertheless adopting a number of the most up-to-date features of the other cars on the market. They still preserve their excellent and old tried system of rear axle drive, with suspended differential and transverse cardan shafts, now known the world over, while their experience of the past season with the disc clutch, which they introduced at last year's show, has caused them to preserve this system this year with a few improvements.

This clutch, which they now put on all their machines, except the single cylinder, 8 horsepower, is excellent on account of its silence, smoothness of operation and ease of upkeep. The slight trouble which was sometimes experienced last year was mainly due to the graphite plugs which were inserted in the friction discs and which

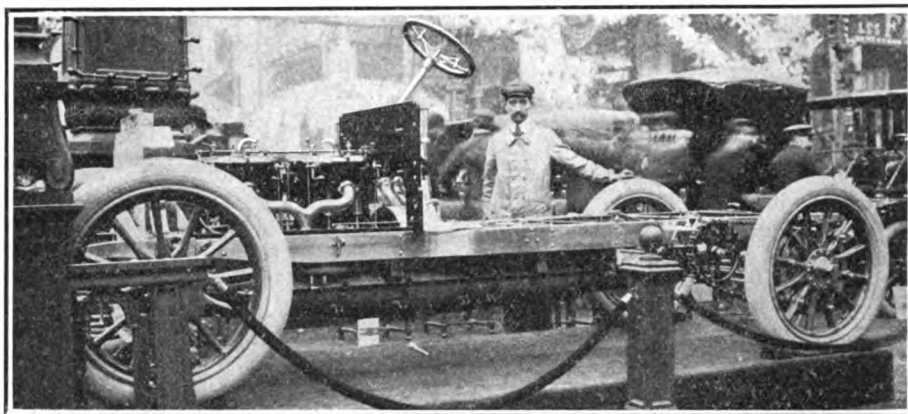
shed small particles and flakes between the contact surfaces which caused slipping. This is entirely done away with this year. The friction plates are now made out of a special friction alloy which is almost self-lubricating and which, at any rate, does away with graphite entirely.

All sizes of cars are now fitted with three speeds and reverse, while the 24-horsepower size is possessed of four speeds. In outside appearance the machines have all felt the influence of the presence of last year's intruder: the four-cylinder machine. The steering pillars are now set at a better angle for the driver's convenience, the tubular frames are entirely ousted by the pressed steel ones, the front axles are not any more tubular, but are made of forged steel, while the clutch pedal is removed to its usual position adopted by the other makers—under the left foot. On the four-cylinder models 15 and 24 horsepower, the operating levers are placed above the steering wheel, increasing the driver's comfort, and the radiator is

brought up above the frame under the now generally adopted type of hood, a fan being fitted to assist its cooling. Double ignition is now fitted even to the two-cylinder motors with a high-tension distributor. The system includes a low-tension magneto, a battery and a single coil, for any number of cylinders.

On the C. G. V. stand one finds two entirely distinct types of chassis: the 14-horsepower town car chassis, not built for touring or for road driving, and the ordinary touring cars of 24, 40 and 75 horsepower, all the machines being four-cylinder.

The town car is fitted with live axle drive and Cee springs. The engine has all its cylinders cast in one piece. The touring cars are chain driven, the countershaft being distinct from the gear box in the heavier model. The town machine engine has all its valves on the same side over a single camshaft, the second and third valves and



CHASSIS OF 50-HORSEPOWER PEUGEOT CAR AT PARIS SHOW.—NOTE REMOVABLE PAN BENEATH THE MOTOR AND TRANSMISSION.

operating a latch, and that one has simply to push it back and forth to change speeds. In Fig. 4 the lever is shown in horizontal section at *L*; it carries on its side a small

a strong coil spring *S* constantly pushing the sector against the lever. When the lever is actuated by the driver, after an effort to push the sector sideways against the springs on account of the V shape of the notches, the push of the same springs will bring the sector back in place when the lever comes opposite to the next notch, thus stopping the driver, unless he furnishes another effort to again overcome the spring pressure.

In the touring car models the valves are symmetrically placed on each side of the engine over two camshafts actuated by inclosed silent gears. The change speed gear is as in the touring models, a cam actuated, two sliding sets system, and gives four speeds and reverse, with direct drive on top gear. The countershaft brakes are exceptionally large, being about 16 inches in diameter and completely inclosed. They are of the cam actuated, expanding type. The clutch is still of the cone and leather type.

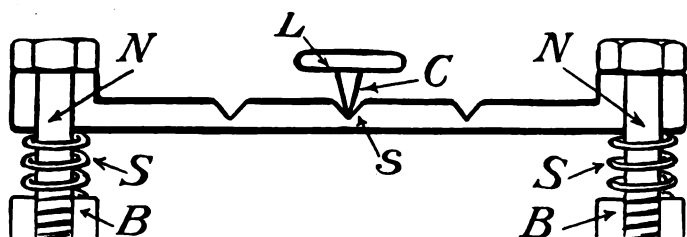
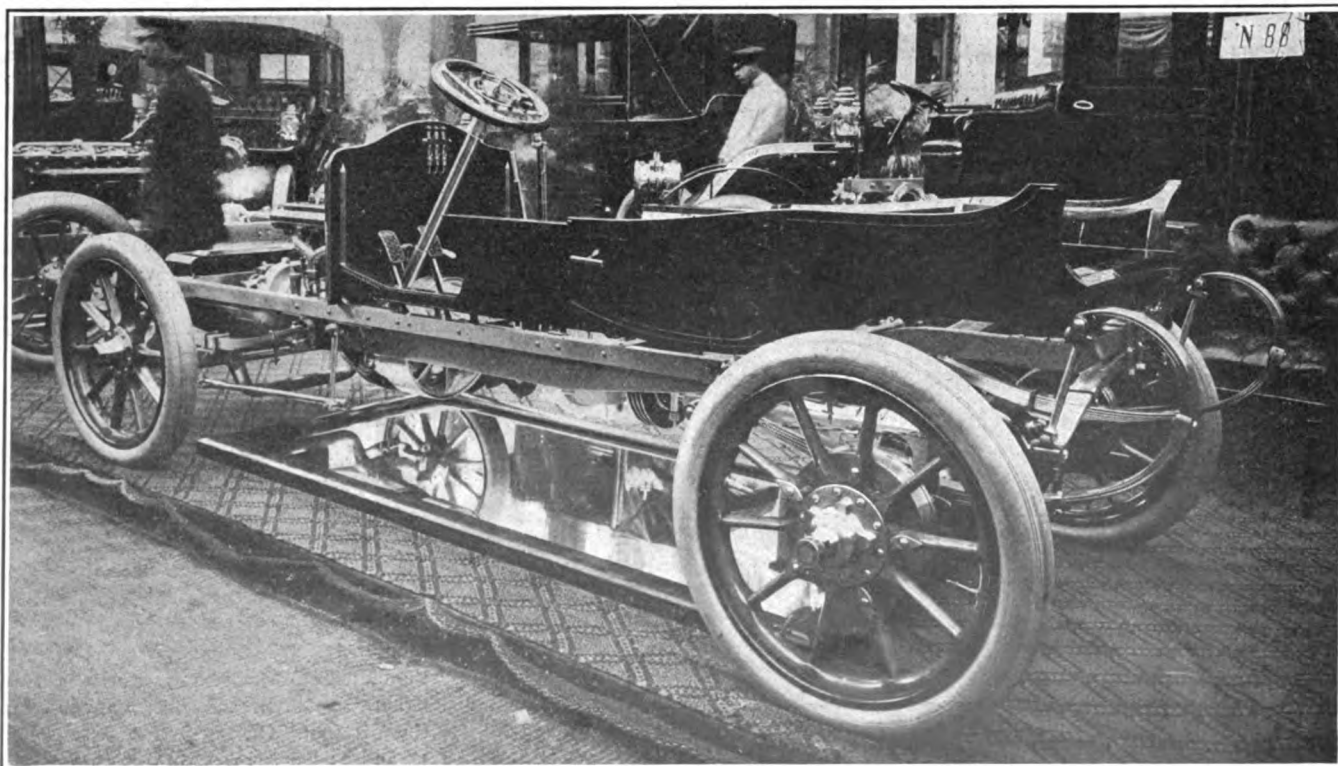


Fig. 4.—C. G. V. Change Speed Device.]

the sixth and seventh being inlet valves, the others being exhaust. Ignition is by high-tension magneto and the carbureter is the usual C. G. V.

The change speed lever is peculiar, inasmuch that there is no trigger or push button

tooth or catch *C* riveted and brazed to it, the sector on which the lever works is placed alongside of it, and instead of being notched on its edges, is notched on its sides; it is slidably mounted at both ends upon studs *N* screwed home on brackets *B*.

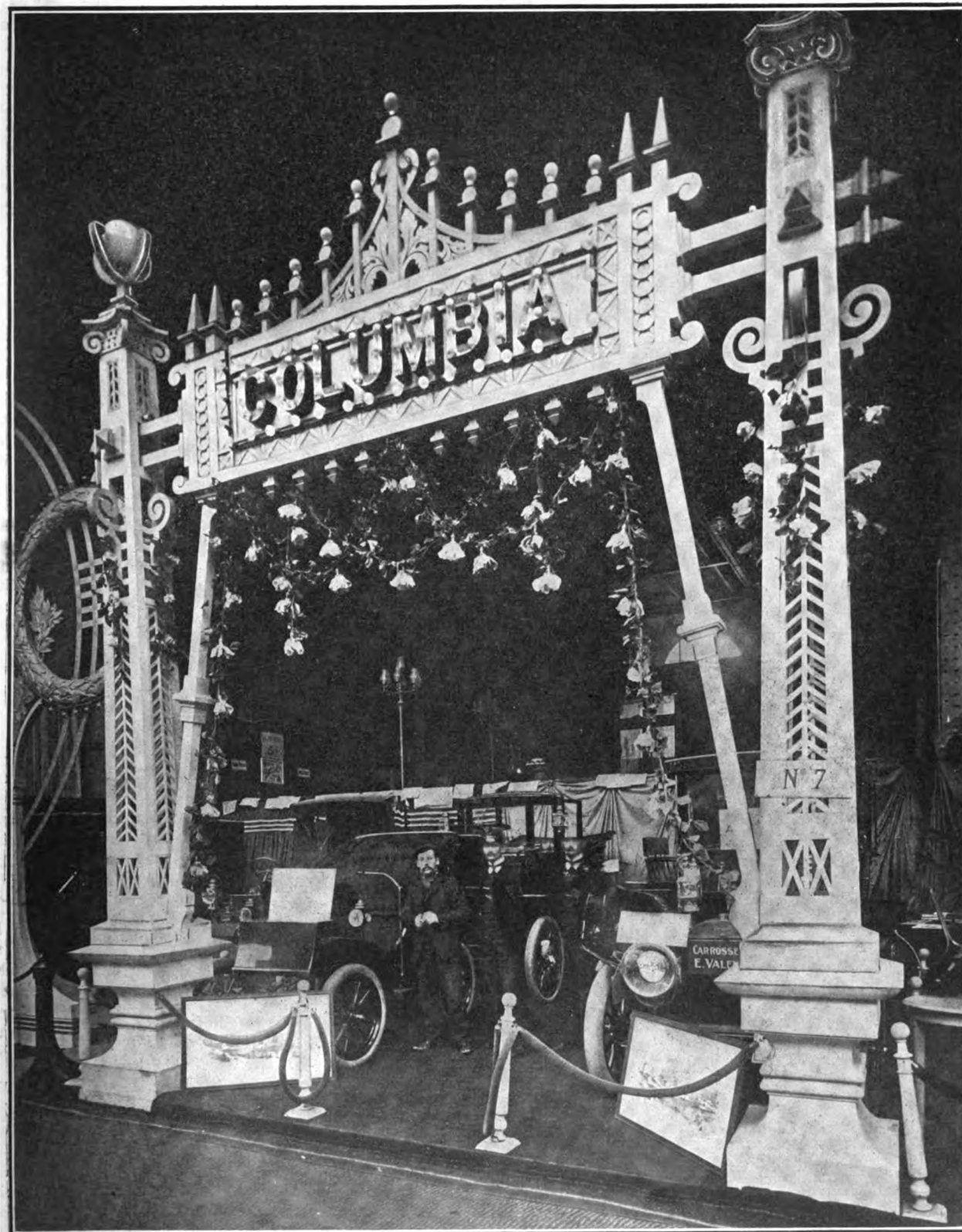


C. G. V. CHASSIS, WITH STEERING PILLAR AT LEFT AND CONTROL LEVERS IN CENTER OF FRAME—NOTE THE PECULIAR TRIPLE SPRING REAR SUSPENSION.

The engine is unchanged either in its general lines or in its construction; it, however, is now regularly fitted with high-tension magneto ignition—with double ignition if

tion of them having already appeared in **THE AUTOMOBILE**, which exactly describes the models shown at the Salon, it will be unnecessary to dwell upon them here.

machines, produced by several factories. These builders seem to have a private competition all to themselves as to who will have the finest chassis in simplicity or in



ORNATE STAND AT THE PARIS AUTOMOBILE SALON EXHIBITING COLUMBIA ELECTRIC CARRIAGES, BUILT BY THE ELECTRIC VEHICLE CO. AT HARTFORD, CONN.

desired. The radiator and hood keep their usual C. G. V. shape.

The Brazier cars have been considerably altered since last year. A special descrip-

The Berliet cars, which count among the very best French machines at present, are made in Lyons, a center from which come to the show a number of excellent

"admirably good complication," as well as in good appearance. The Berliet frame is of pressed steel, narrowed at the front. The motor is bolted to the frame sides and is a

four-cylinder, cast in pairs, with interchangeable valves, all mechanically operated. The ignition is by make and break magneto, of the Sims-Bosch make. The engine is fitted with a centrifugal governor acting upon the throttle. The radiator is honeycomb, and the water is circulated by a centrifugal pump, the air draught being produced by fan blades formed by the arms of the flywheels. The clutch is the old Berliet metal-to-metal type. Four speeds and a reverse are provided. There are two separate brakes, each independently actuated by its own pedal on the differential, while a third brake is supplied by the hand lever which expands two hub brakes in the rear wheels sprocket drums, the drive being through side chains. Ball bearings are fitted throughout except in the motor.

The American Locomotive Co., which acquired the American license for this machine, has a stand in the main hall, not far from the Berliet stand, in which is exhibited a machine presumably made in America, and which reproduces exactly the original Berliet except, perhaps, for the hub caps.

During the past year the sum of \$112,000 has been expended by the government of Porto Rico in improving the highways of the island, the most famous of which is the Military Road, which connects San Juan and Ponce.

Brakes of Various Types and Their Use.

By MAURICE PARDET.

OF the greatest importance in an automobile is the ability to quickly check the vehicle's speed, or to bring it to a stop when necessary in the shortest possible space; and the importance of brake efficiency increases as the speed of the car increases, reaching the maximum in the swift racing car, in which the speeds obtained are abnormal.

Braking effect is commonly obtained in an automobile by friction, the energy stored in the moving vehicle being converted into heat at the contact surfaces of the brake. Friction is usually obtained by causing a fixed band or ring to contract upon or expand within a drum, setting up more or less friction, according to the pressure used in bringing the surfaces together; the energy required to bring the surfaces together is usually supplied by the driver of the car, through a lever or a pedal, though there are in use several mechanical devices for doing this work, some of which are extremely ingenious.

TYPES IN EARLIER DAYS.

We must look to the builders of horse-drawn vehicles for the principles of many forms of brakes that were used on the early French automobiles. Among the brakes in use before the automobile became a practical vehicle was the Lemoine brake, extensively

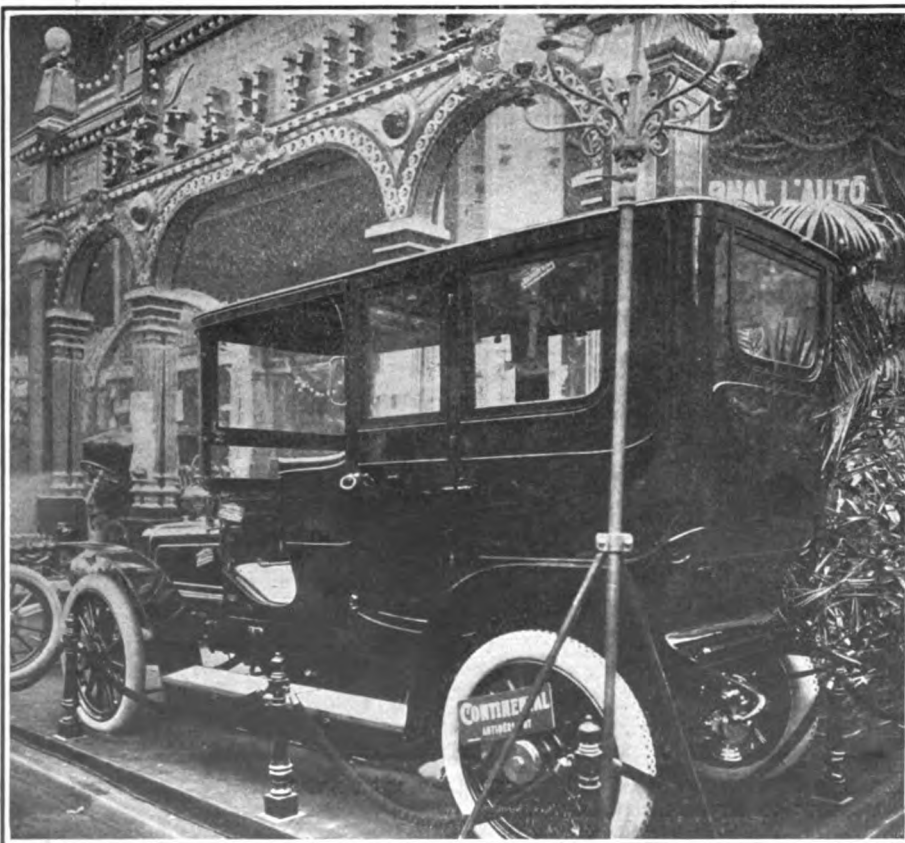
used in the French artillery and also on the omnibuses of Paris. The Lemoine brake utilized the traction of ropes wound around a drum to apply an ordinary shoe brake to the tire of the wheel. When the brake was idle the ropes were loose on the drums; tightening the coils caused them to have a tendency to travel around on the drums. The free ends were attached to a brake beam carrying the brake shoes, so that the pull of the rope on the drums drew the shoes against the tires. This was an exceedingly powerful brake, but lacked a very important feature—it would only work when the vehicle was moving forward. Also, it was of no use when the wheels were not revolving, as the pull on the ropes was dependent upon the revolution of the drums.

The present custom is to produce braking action either by tightening a fixed band on the surface of a revolving drum, or by expanding a band or jaws against the internal surface of a hollow drum fixed on the shaft or wheel, the brakes acting equally well whether the car is going forward or backward. The brakes should have sufficient frictional resistance and sufficient strength to stop the car within the shortest possible distance, as the speed of which modern machines are capable makes quick stopping very necessary. The distance covered by the car, after the application of the brakes, before it comes to a stop will evidently be proportioned to the initial speed and the weight of the machine, as well as the friction of the brake.

MAXIMUM BRAKING EFFECT.

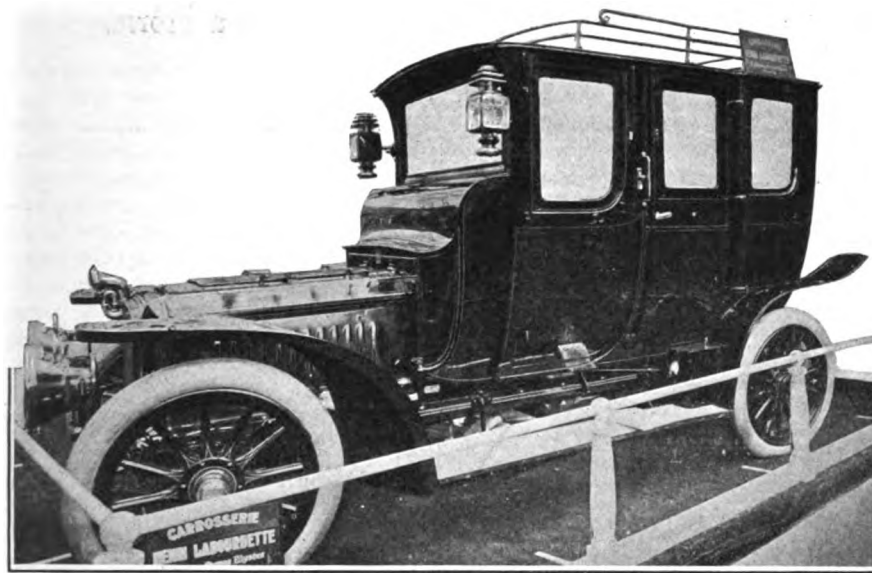
The maximum useful braking effect is that which will stop just short of causing the wheels to slide without turning. It is not a difficult matter to lock the wheels of most cars so that they will slide along the road; but tires suffer severely from the friction with the road, and, moreover, as soon as the wheel begins to slip the braking action is considerably lessened and there is a strong tendency for the rear wheels to slew around sideways. The pressure required on the brake varies, however, with the speed of the car, for the reason that the higher the speed the smaller the coefficient of friction in the brake.

Extensive experiments made by Douglas Galton show that at circumferential speeds corresponding to twenty miles an hour and fifty miles an hour the coefficients of friction vary in the ratio of 2 1-2 to 1. Therefore, in order to produce the same frictional effect, the pressure on the brake must be 2 1-2 times greater at fifty miles an hour than at twenty; the pressure must be decreased as the speed decreases, for if this is not done the friction, increasing as the speed decreases, will soon lock the wheels. This shows how necessary it is to have brakes that are easily and accurately controlled, and that no slight degree of skill and judg-



DECAUVILLE CAR AT PARIS SHOW WITH CONVERTIBLE LIMOUSINE BODY BY AUDINEAU.

The sides are readily removable by unscrewing bolts inside which are hidden by the upholstery, thus transforming the car into a double phaeton with fixed dash and extension top. When the sides are removed, padded arm rests are placed over the grooves so that there is nothing to indicate that the car was ever anything else than an open vehicle. Distortion due to use of wide-angle lens in camera.



PANHARD CAR WITH LABOURDETTE LIMOUSINE BODY SHOWN AT PARIS SALON.

Driver's seat entirely enclosed, with entrance through door on left side as shown, the right side being permanently closed. The door is hinged to swing forward. The doors giving entrance to the rear portion open toward the rear. Steering wheel is under the curve of the high dash, and the window above is hinged to swing up against the roof. Wide angle lens of camera causes bad distortion, especially noticeable at front end of car.

ment is required to use the brakes in the most effective and least harmful way.

COMPRESSED-AIR BRAKE.

The difficulty of obtaining sufficient experience and skill to manipulate brakes in the most advantageous way is responsible to a great extent for the fact that inventors and manufacturers of automobiles are constantly on the lookout for better brakes. An interesting effort in this direction was shown at the 1904-5 Paris show and consisted of the application of compressed air to the operation of the brakes. Though crude and lacking in refinement of detail, this brake possessed many advantages over the ordinary type. [This had previously been successfully applied in an American car.—Editor.]

The ordinary brake is a source of constant fatigue to the driver, especially in heavy traffic; and, moreover, it diverts his attention from the steering of the car and the handling of his gears. Again, it is too slow for the best effect, because the necessary leverage is obtained only by lengthening the stroke of the lever and consequently the time required to set the brake. The little valve handle required to operate the air brake makes it possible to apply the brakes with much celerity. There is, however, a fault with the air brake; it almost invariably locks the wheels. It would seem that when fully developed, this brake will have a great future for automobile work.

The use of shoe brakes acting directly on the tires was soon abandoned because of the destructive effect on the tires and because the friction between the shoe and a wet tire was very slight, quite insufficient for the purpose. It was found necessary to adopt the expedient of using a separate drum, attached to the hub, to the driving sprocket where drive is by side chains, or to some other rotating part, such as the differential shell, the driving shaft or the transmission shaft.

EQUALIZING BRAKING EFFORT.

With hub brakes it is very important that the braking effect should be the same on both wheels, as unequal braking lessens the effectiveness of the brakes and tends to cause skidding. It is, therefore, good practice to use some form of equalizer. Most commonly this consists of a beam to the center of which the brake lever is connected, the brakes being connected to the two ends of the beam. This apparatus, however, is very limited in its capacity for equalizing friction.

A brake gear used on the old Mercedes cars had the same drawbacks. In this arrangement the hand lever rocked a hollow cross shaft, at each end of which was a

grooved arm. A cable passed through the hollow shaft and over the grooved ends of the arms, and the cable ends were secured to the brakes. When the driver pushed his lever the cable was pulled tight by the arms and any inequality of tension was equalized by the slipping of the cable through the shaft and over the arms.

LEMOINE BRAKING SYSTEM.

Another arrangement was that of Lemoine; this consisted of an arrangement exactly similar to a bevel gear differential, except that it only moved through a small part of a revolution. The bevel pinion was adapted to be moved in an arc with the shaft of the large gears as a center, by the brake lever; the large bevels, however, in this case consisted of sectors only, the sides opposite to the pinion being formed into levers to which the brake rods were attached. The action was precisely similar to that of the bevel gear differential.

Another early brake consisted of a rope coiled around a drum, blocks of wood being interposed between the drum and the rope to prevent the rapid wearing of the latter.

A form of brake that was much used in earlier days, and is still in use on small and inexpensive cars, consisted of a spring steel band with a lining of some friction producing and wear resisting material. One of the ends is attached to a fixed point, the other being connected with the brake lever. The natural spring of the steel keeps it clear of the drum when not held on by the lever.

A serious defect possessed by most of the old brakes was that they would not hold the car, if it started to run backwards, as, for instance, down a steep grade if the motor stalled. An arrangement adopted by a number of makers, including some in England, was to use two bands on the same drum, starting from a common fixed point, but



STAND OF AN AMERICAN EXHIBITOR AT THE GREAT PARIS SHOW.

wound around the drums in opposite directions; both bands were operated by the same movement of the lever. This construction was expensive, however, and gave no better results than the simpler and no more expensive forms devised later on.

INTERNAL AND EXTERNAL TYPES.

Two-piece brakes came later, and were of two general types, internal and external. The external type was the earliest, but is found on the smallest number of modern European cars. The two parts, generally steel or iron castings, are sometimes in direct contact with the drum, and sometimes lined with other material. A cheap and easily renewable metal lining was much favored; brass, bronze, copper, steel and castiron all had their advantages. Soft, anti-friction metal was tried, but proved to be unequal to the heat generated by prolonged braking and would melt and run out.

Many different methods of operating these brakes were devised, but the best was an eccentric arrangement, which was quick and certain in action and was, to a certain extent, self adjusting for wear. A toggle system was also extensively used, and had many good points. A device which was powerful but slow in action consisted of a short rod with a right-hand thread on one end and a left-hand thread on the other. The threads were screwed on to suitable lugs in opposite halves of the brake; rotating, the rod caused the brakes to close or open, according to the direction of rotation.

Brakes of the internal expanding type are now more commonly used in European cars than any other one type, though they are not altogether free from defects. One drawback is the liability to overheat, owing to the lack of free air circulation. In the brake used by the manufacturers of the Clement cars, and which will be used in the 1906 C. G. V. cars, the two parts of the internal

brake are kept together and out of contact with the drum by a stiff spring. A pair of levers, pivoted at their centers, serves to press the halves apart and against the drum. The French firm of Peugeot uses an internal brake on the transmission, and special means are adopted to prevent overheating. The brake is enclosed in an oil-tight casing and runs continually in a bath of oil. This gives excellent results, and has been adopted as the standard for the Peugeot car.

CHENARD-WALCKER BRAKE.

The Chenard-Walcker clutch brake has been in use for many years. This system consists in using the clutch cone as a brake. The clutch is of the ordinary cone type, engaged by being pushed into a recess in the flywheel. The cone is double, however; when the movement of withdrawing the clutch is continued after the clutch is free, the cone on the back of the disc enters an internal fixed cone, and great friction is set up. The disadvantages of this arrangement are that the brake cannot be used until the clutch is disengaged; and it is useless if any of the connections between it and the rear wheels are broken or if the gears are in the neutral position.

The French Raissinier brake acts on the interior and the exterior of the drum at the same time, and has given remarkable results in tests. Two rollers are mounted on a lever in such a way that when a brake is in the off position the drum passes between the rollers. By swinging the lever the rollers are made to bear against the drum, on opposite surfaces, and a powerful braking action is the result. In an official test a car, fitted with this brake, carrying five passengers, was brought to a stop in thirty feet from a speed of thirty miles an hour. All the parts are thoroughly lubricated, and the brake seems to be, in many ways, almost an ideal one.

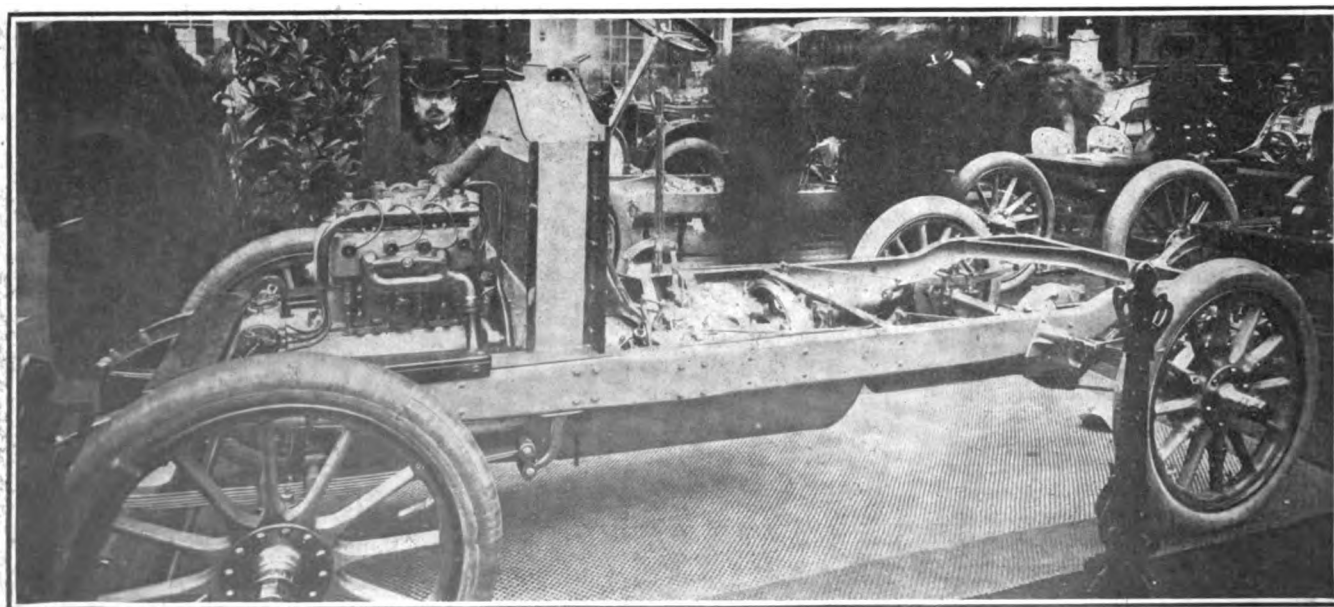
"Get a Horse."

According to the New York *Sun*, the expression "Get a horse" may have had its origin in Ireland, and if so, the original automobile must have been no automobile at all, but a flying machine, either that or it had amphibious habits. Anyhow, as Bobby Gaylor used to preface his stage remarks, this is the discussion as printed in the "Questions and Answers" department of the *Sunday Sun*:

The nurse corrected my children for shouting "Get a horse" at a passing automobile. The correction I approve on the score of manners, but its method has puzzled me. She said: "'Twas saying that same that took Manny Malone from Arrow Hill and set him down in Spain." When asked to explain, the girl said it was a foolish thing and she didn't remember the rights of it. Who was Manny Malone and how did he come to imitate Lord Bateman?

C. H. LANE.

"It seems to be, with some small inaccuracies of names, a story that Thackeray, in Chapter 16 of "The Irish Sketch Book," recites as contained in "Hibernian Tales," which he identifies solely as one of "two little yellow volumes purchased at Ennis." This is his quotation: "In the parish of Ahoghill lived Manus O'Malaghan. As he was searching for a calf that had strayed he heard many people talking. Drawing near, he distinctly heard them repeating, one after the other, 'Get me a horse, get me a horse'; and 'Get me a horse, too,' says Manus. Manus was instantly mounted on a steed, surrounded with a vast crowd, who galloped off, taking poor Manus with them. In a short time they suddenly stopped in a large, wide street, asking Manus if he knew where he was. 'Faith,' says he, 'I do not.' 'You are in Spain,' said they." A pleasing tale of the little folk.



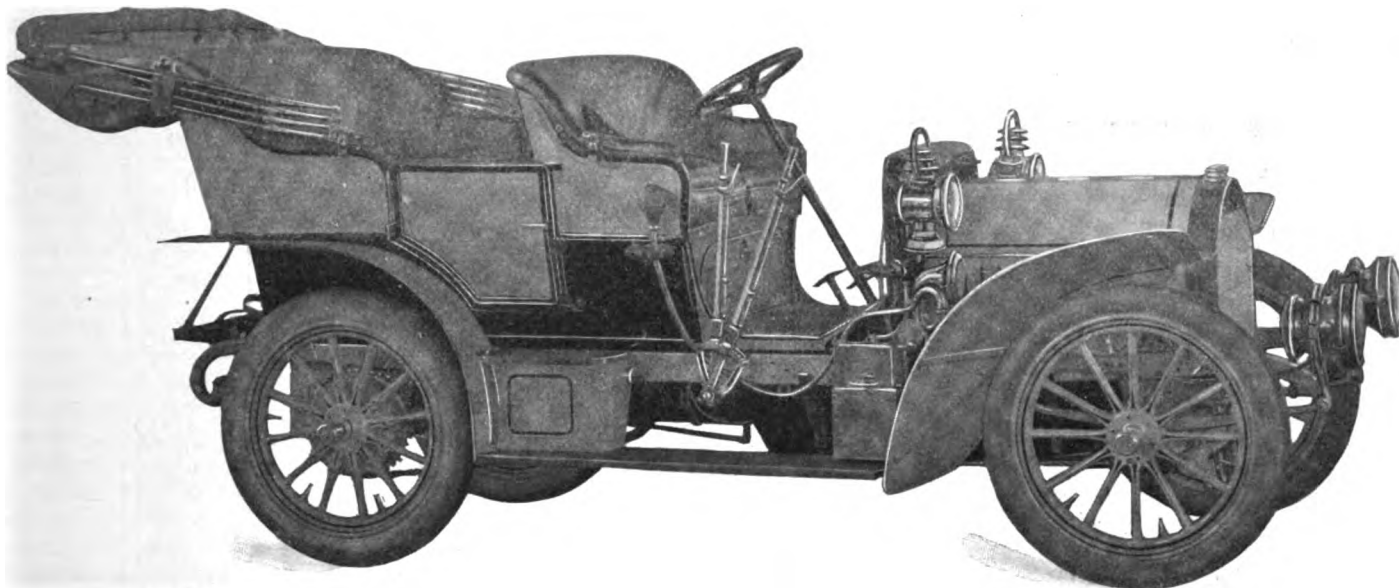
RENAULT 10-HORSEPOWER TOWN CARRIAGE CHASSIS, AT PARIS SALON WITH FOUR-CYLINDER MOTOR IN ONE CASTING.

Locomobile Features of Construction.

IN designing the two models that will be placed on the market for the season of 1906 by the Locomobile Company of America, of Bridgeport, Conn., the lines followed in former Locomobile models have been closely adhered to and what changes have been made are in the matter of detail; the manufacturers state that the main features of the car remain practically as they were in the first gasoline cars built by this concern.

to tell one machine from the other at first glance, but on looking closer it will be seen that the smaller car, Type E, has a concave dash, the larger machine having a flat dash; the tonneau of the larger car is also longer in proportion than the other. Bodies are of the straight-line type, built up of bent wood with roomy and comfortably upholstered seats, the front seats being of the popular divided type; running-boards extend from

ical make and break, low-tension current being generated by a gear-driven magneto built by the Locomobile Co., and the time of ignition is varied by shifting the ignition cams so as to bring different parts of the varied-profile cams under the tappet rods. The motor speed is controlled by hand through a governor working on the throttle. Power is transmitted to the transmission gears by a leather-faced cone clutch; the sliding gears give three speeds forward and one reverse, operated by a single lever, with direct drive on the high gear. Differential



LOCOMOBILE 15-20 HORSEPOWER TYPE E TOURING CAR FOR 1906. WITH CONCAVE DASH AND STRAIGHT-LINE BODY.

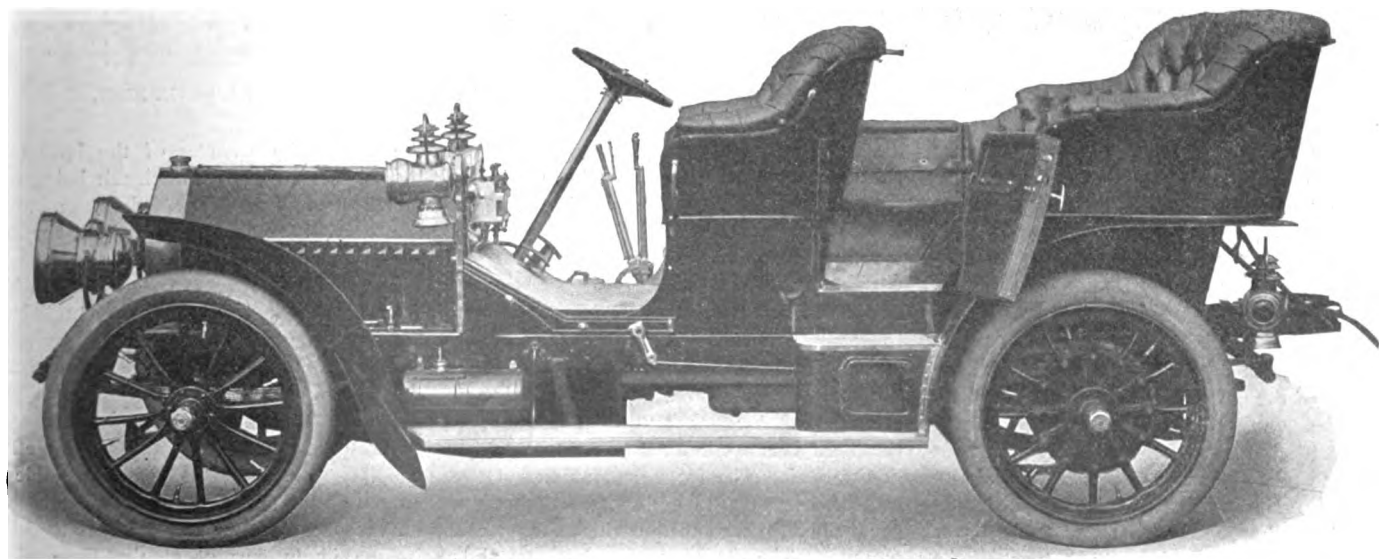
The new models will both be side-entrance touring cars of the conventional type, side-chain driven, with four-cylinder vertical water-cooled motors. Type E will have a motor of 15-20 horsepower, while Type H will have a motor of 30-35 horsepower. With the exception of the difference in dimensions and a few details, the two cars are mechanically identical. In outside appearance there is an absence of marked distinguishing features that makes it difficult

front to rear fenders, and the chain guards form steps to the tonneau. The footboard has the upward slope that is usually seen on touring cars; the hood is of the Mercedes form, of aluminum, with ventilated sides.

With regard to mechanical features, the general specifications of the two models are identical. The four-cylinder vertical water-cooled motor is bolted by the crankcase arms direct to the main frames, no sub-frames being used. Ignition is by mechan-

and bevel gears for driving the jackshaft are enclosed in the rear end of the transmission gearcase; the rear wheels are driven by side chains, the sprockets being bolted to the spokes of the rear wheels.

The motor has its cylinders cast in pairs; heads, water jackets and valve housings are integrally formed, and the cylinders are bolted to the crankcase by flanges in the customary way. The valves are mechanically operated and are placed on opposite



LOCOMOBILE 30-35 HORSEPOWER TYPE H TOURING CAR, WITH LONG WHEELBASE AND STRAIGHT DASH. —NOTE LUGGAGE RACK AT REAR.

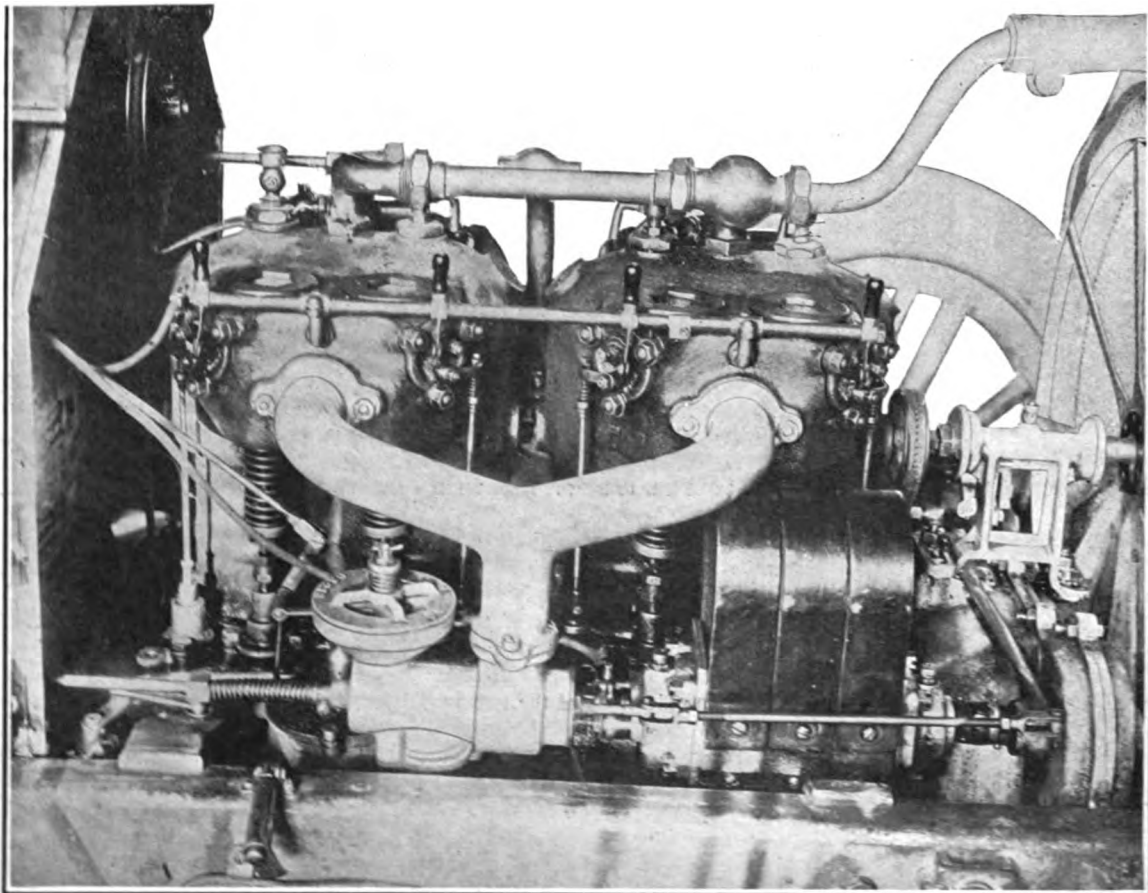
sides of the cylinders, the inlet valves on the right and the exhaust valves on the left; valves are all alike and interchangeable, and each is made from a single steel forging. The lower end of the valve-stem is plain; the upper end of the push-rod is equipped with an adjusting arrangement consisting of a cap-nut held in place by a jam-nut below it; by screwing the cap-nut up or down, the effective length of the rod may be varied, the jam-nut holding the adjustment when obtained. The valve springs are held in compression by concave washers kept in place by keys passing through the stems. Removing a valve spring is made easy by the use of a special forked tool which is passed over the valve stem below the

prevent the rod from turning and bringing the axis of the roller out of parallel with the axis of the camshaft. The squared part is of ample size to give good wearing qualities and, together with the roller, pin and other parts of the rod, is hardened and ground. The push-rod guide enters a counterbore in the top of the crankcase for a short distance and screws passing through flanges hold it in position.

Each camshaft, with all its cams, is made of a single steel forging and is hardened and ground all over. The camshafts are interesting pieces of work, especially the inlet camshaft, which carries the ignition cams in addition to the inlet valve cams. The valve cams are, of course, sufficiently long so that

dinal motion without lateral play; the movement of this shaft from extreme advance to extreme retardation of spark is three-quarters of an inch. The camshafts run in bronze bearings and are lubricated from the crankcase.

The ignition system has been worked out with a view to obtaining the greatest possible freedom from electrical troubles; there is no wiring about the body of the car—in fact, the only wiring is the connection between the magneto and the bus-bar on the engine, which is in an accessible position and not liable to damage. The fact that there is no high-tension current to insulate is a point in favor of the low-tension system. The bus-bar is connected to each of



INLET SIDE OF LOCOMOBILE ENGINE, SHOWING CARBURETER, MAGNETO AND MAKE-AND-BREAK SPARK MECHANISM.

washer and its ends rested on a lug cast for the purpose on the adjacent cylinder wall; by raising the fork the washer and spring are raised and the key can be removed from the valve-stem, leaving the spring free to drop and the valve-stem free to pass upward through the guide. The valves are removed through openings directly over them, closed by screw plugs; the joints of the plugs are made tight by gaskets of copper and asbestos. In the top of each valve guide is a central boss with a slot cut out to take the screw-driver or special tool used in grinding in the valves. The push-rod has a hardened steel roller on its lower end to take the cam thrust; the part of the rod that slides in the guide is secured to

the push-rod rollers will not drop off when the shaft is moved longitudinally in varying the time of ignition; the apex of each valve cam is parallel with the axis of the shaft, so that the timing of the valve is not changed with the movement of the shaft. The ignition cams, however, being made with a view to varying the time of ignition, have their apexes disposed at an angle with the axis of the shaft, like the thread of a screw of very steep pitch. A collar for the fork, by which the shaft is moved, is also an integral part of the shaft. The front or gear end of the camshaft is squared and passes through a square hole in a sleeve on which the gear is mounted. The shaft is a close but easy sliding fit in the sleeve so as to allow longitu-

the insulated electrodes of the igniters by knife-blade switches, the circuit being completed through the body of the magneto and the metal of the engine, to which the magneto is grounded.

The magneto is secured to the right-hand front arm of the crankcase by a single heavy bolt, steel dowel pins preventing swivelling and at the same time permitting the removal of the magneto with the minimum of trouble. The magneto is driven from the gear on the inlet camshaft through a simple little coupling which makes it impossible to couple up the machine wrongly—a matter of importance, as the magneto is set to deliver its maximum current at the time of advanced ignition. The coupling consists of



PARTS OF LOCOMOBILE VALVE SEPARATED, SHOWING PUSH-ROD AND GUIDE, SPRING AND STEM WITH MUSHROOM.



PARTS OF LOCOMOBILE MAKE-AND-BREAK SPARK MECHANISM SHOWING PLATES WITH HAMMER AND ANVIL AND PUSH RODS.

two plates, one on the gear shaft and the other secured by its hub to the shaft of the magneto armature; in the illustration showing the parts of the magneto the coupling may be seen, one-half attached to the end of the shaft of the separate armature shown, and the other half lying close to it. Each plate has a pin in one end and a slot in the other; in coupling up, the pin in one plate is entered in the slot in the other; and there is no other way of putting the parts together. The H-armature has heavy bronze ends secured to it by screws which are sweated in. The short sections of shaft

and throw off any oil that might work past the bearings. Oil is thus kept off the armature, and a serious difficulty sometimes experienced with mechanical generators is, according to the manufacturers, avoided entirely, practical road tests having shown that the oil does not reach the armature. The excess oil runs off through vent holes. Aluminum castings screwed to the body of the magneto support the bronze bearings. The inner end of the armature winding is grounded in the metal of the armature core; the outer end is attached to a steel pin which passes through a hole drilled through

ground connection another brush is fitted, as the contact between the shaft and its bearing is electrically imperfect owing to the oil used for lubrication. The ground brush is a small rod of carbon pressed against the shaft by a light helical spring. The manufacturers state that during the prolonged and severe tests to which the first 1906 cars were subjected the magneto gave no trouble whatever, and even at the conclusion of the testing period required no attention.

The make and brake electrodes are carried by a plate having a tapered face like a

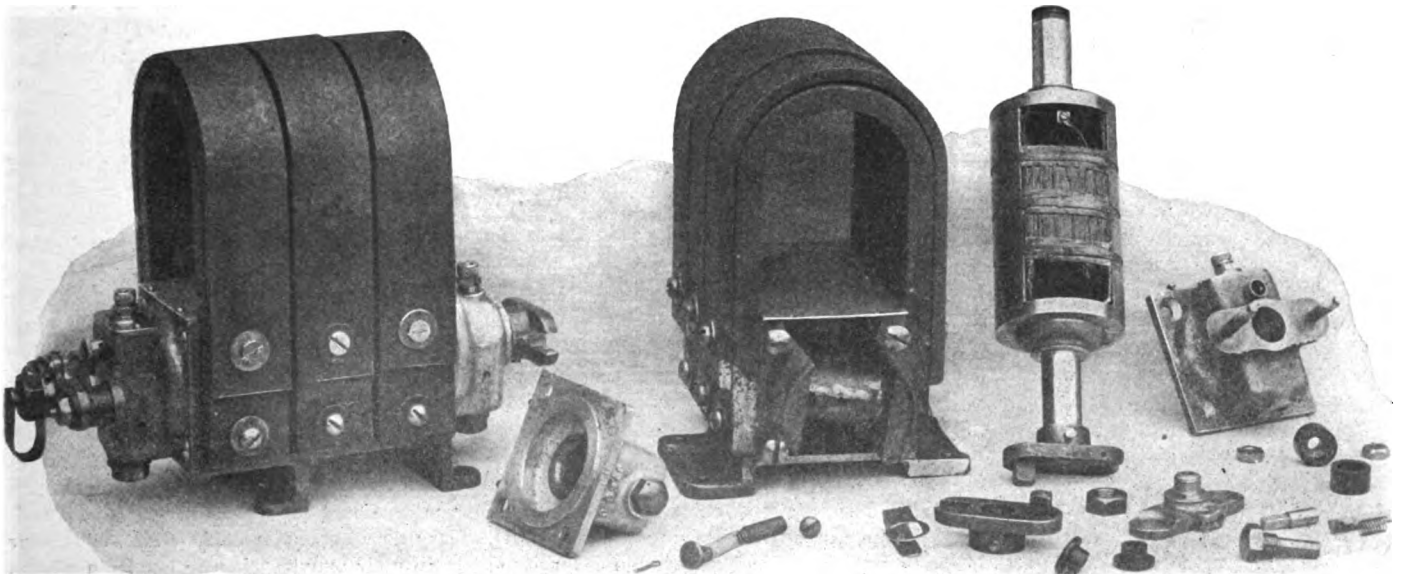


LOCOMOBILE CAMSHAFT WITH INTEGRAL CAMS, FORGED IN ONE PIECE, HARDENED AND GROUND.

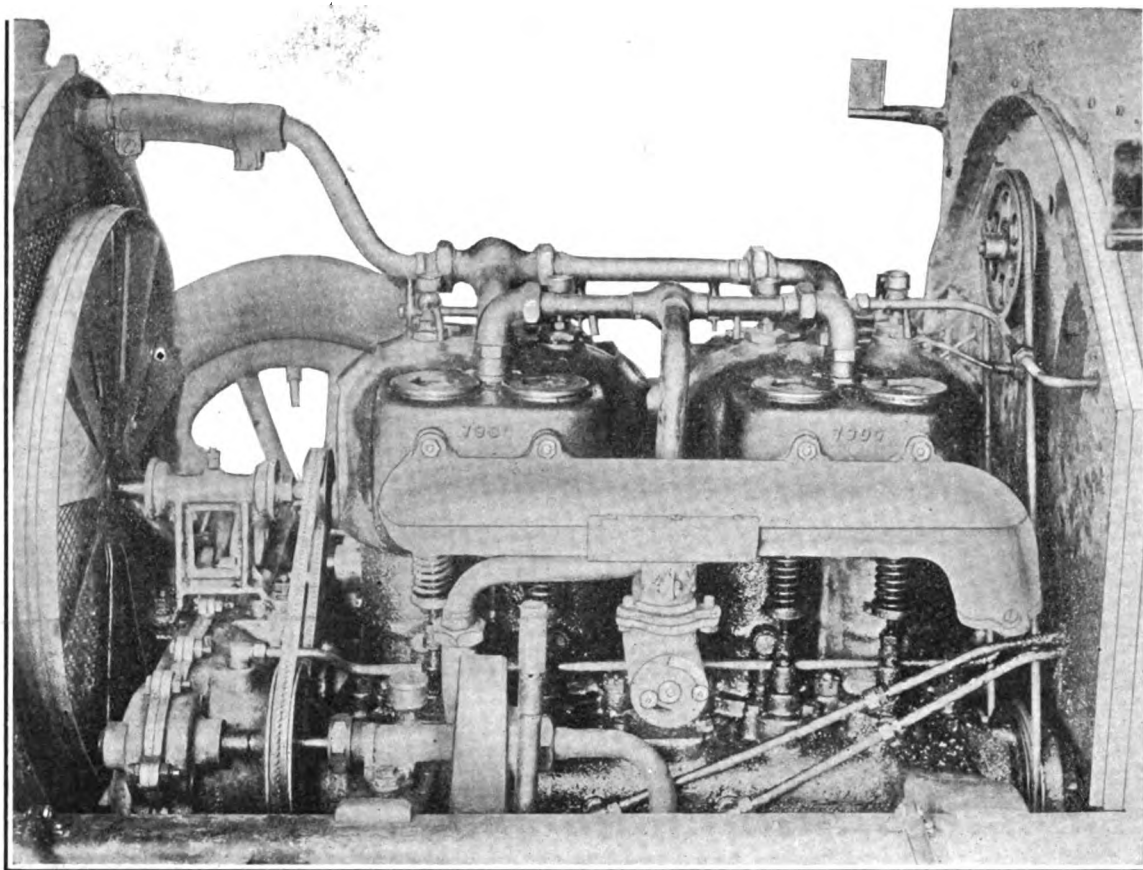
on which the armature is supported are screwed tightly into the end pieces, the ends riveted over on the inside and, as a final precaution, a "dutchman"—a pin driven into a hole drilled lengthwise half in the shaft and half in the end piece—is inserted. The journals are supported in bronze bearings and are provided with rings close to the armature; these rings revolve with the shaft

the center of the shaft; the pin is insulated from the shaft, and the current passing through it is taken up by a brush, made of flat steel bent upon itself and pressing against the pin; from the brush, which is insulated, the current is led to the bus-bar by a wire. This spring brush is clearly shown at the extreme left-hand end of the shaft of the complete magneto. For the

poppet-valve, which fits a corresponding seat in the side of the inlet valve chamber, the surface being ground to a gas-tight fit; three screws hold the igniter plate in position. The stationary electrode in the cylinder is insulated and carries, outside the cylinder, the contact pieces for the knife-blade switch; the inner end carries an iridium contact point. The movable



LOCOMOBILE MAGNETO ASSEMBLED AND SEPARATED TO SHOW H ARMATURE IN POSITION IN HORSESHOE MAGNET, AND DRIVING CONNECTIONS



EXHAUST SIDE OF LOCOMOBILE ENGINE, SHOWING PUMP AND FAN WITH BELT DRIVE AND BELT TO LUBRICATOR.

electrode, which is not insulated and is therefore in electrical connection with the magneto through ground, has an iridium-tipped arm or hammer inside the cylinder making and breaking contact with the stationary electrode or anvil, while outside the cylinder it is rigidly secured to another arm to which motion is imparted by the tappet rod. The contacts are brought together by the rising of the tappet rod on its cam an instant before the spark is required; at the proper time the cam allows the rod to drop suddenly, with the result that the contacts inside the cylinder are suddenly separated and a short, hot arc is formed.

Pistons are made slightly tapering, the head or closed end being slightly smaller than the open end to allow for unequal expansion when the motor is at work. The piston on the 15-20-horsepower motor is 3 3/4 inches in diameter, has a stroke of 4 1/2 inches and is 5 1/2 inches long; the 30-35-horsepower motor has pistons 4 1/2 inches in diameter with a stroke of 5 1/2 inches, and the pistons are 8 1/2 inches long. Being light, the pistons are cast with interior webs for the sake of strength. The four rings on each piston are turned eccentric and are split diagonally; oil grooves are cut in the lower part of the piston. The piston pin is of hollow steel and is effectually prevented from protruding and scoring the cylinder walls by screws passing through the boss in the cylinder and the wall of the pin. In the ends of the screws are holes; a single wire passes through both

holes inside the pin and the ends are bent over, making a safe locking arrangement.

Connecting rods are of I-section with bronze bushings at each end; the piston pin bushing is solid, while the crank-pin end is split marine fashion and is fitted with a series of copper shims between the brasses. These shims are of different thicknesses so that nice adjustments for wear can be made by removing a shim of the proper thickness and bolting up the brasses again. Two steel bolts hold the cap on the end of the connecting rod.

Crankshafts, like all other forgings, are made in the forging shop of the Locomobile plant; they are of a special steel and are given a toughening treatment after forging. The shaft runs in three bronze bearings. The flywheel is bolted to a flange forged integral with the shaft, steel fitted bolts being employed. The bearing surfaces of the crankshaft are hardened and ground.

The crankcase is split horizontally; the upper half is cast of manganese bronze, which gives ample strength to withstand the stresses imposed by the work of carrying the cylinders and the crankshaft. The lower half is of aluminum, having no more severe work than carrying lubricating oil and keeping out dust and dirt. The supporting arms are cast integral with the upper half of the crankcase and are of deep box section, open side downward. All the gearing for driving the camshafts, magneto and circulating pump is enclosed in an aluminum casing at the front of the

engine and all can be exposed by the removal of a cover which protects all the gears.

Circulation of the cooling water is maintained by a centrifugal pump bolted to the left-hand front arm of the engine and driven by a pinion meshing with the large gear on the exhaust camshaft. A cellular cooler is placed in a cradle or dropped crosspiece, and is not attached to the side frames. To this fact the manufacturers attribute much of the freedom of their radiator from leakage, as it is not twisted by the springing of the frames on rough roads. A large aluminum fan with a stiffening ring at its circumference is mounted on a spindle running in ball bearings in a bracket bolted to the top of the casing which covers the gearing at the front of the engine. The fan is driven by belt from a pulley mounted on the pump-shaft between the pump and its driving gear. The tension of the fan belt can be adjusted by shifting the bracket, slots for the holding-down bolts being provided for the purpose. A small circulation indicator on the dashboard keeps the driver informed as to the work his pump is doing.

The float feed carburetor is fitted with an aluminum auxiliary air inlet and has a balanced throttle of the piston type, operated by a centrifugal governor; the ordinary air inlet is sufficient for speeds up to about 15 miles an hour on the high gear, after which the auxiliary air valve opens. The auxiliary air is taken in cold, while the regular air supply may be taken in hot from a hood surrounding the exhaust manifold or may

be taken in cold, according to temperature and atmospheric conditions. Priming may be done from the seat by means of a handle on the dash.

A lubricating oil pump placed on the dashboard is belt-driven from the rear end of the exhaust camshaft. Three leads carry oil to the compartments of the crankcase and to the gear casing at the front of the motor. The lubrication of the pistons and rod bearings is accomplished by splash. A standpipe projects upward into each crankcase compartment, so that when the oil is too high it overflows and can be let out through drip cocks placed under the crankcase and operated from the dashboard. A hand oil pump is fitted for emergency use.

The clutch is of the leather-faced cone type, and has flat springs behind the leather to prevent sudden and "fierce" gripping. Between the clutch and the transmission gear is a double universal joint. The clutch is held in engagement by two helical springs carried on studs on each side of the shaft. The springs can be quickly adjusted and can easily be removed if necessary. Thrust is taken by ball bearings, and the usual pedal controls the clutch. The transmission gears are enclosed in a case made of three parts; the main or central part, which carries the bearings and is subjected to practically all the stresses, is of manganese bronze, while the top and bottom sections are of aluminum. The case encloses the bevel driving gears at the rear end. A single sliding set controlled by a single lever gives all three speeds and reverse. The gear shafts run in plain phosphor bronze bearings lubricated by oil from the gearcase, pockets being provided to catch the lubricant. All the gears are of special steel, hardened. The differ-

tial is of the bevel gear type and its casing is of forged steel. The left-hand differential sleeve extends beyond the casing and carries the drum for the differential brake. Each half of the jackshaft is fitted with a compensating joint to allow for frame springing. The outer ends of the jackshaft run in bronze bearings; the sprockets are of hardened steel.

The frame is of pressed steel with four pressed steel cross members and is hot riveted together; the two middle cross members are used as supports for the transmission gearcase. Forged steel spring horns are hot riveted to the ends of the side frames. Springs are all semi-elliptic and have bronze bushed eyes and fitted steel bolts. Front and rear axles are of I-beam section, each forged in two pieces and hand welded in the center; the front axle is dropped at the center and with it are forged the steering heads; all wheel bearings are plain bronze bushings with grease reservoirs to ensure adequate lubrication.

Besides the band and drum brake on the differential there is an emergency brake, consisting of expanding rings in cast steel drums on the hubs of the rear wheels. The emergency brake is connected to the hand lever by steel cables, a compensating ar-

angement equalizing the pull on each side. Steering gear consists of an inclosed worm and sector.

The 15-20-horsepower car has a wheelbase of 93 inches, 32-inch wheels with 4-inch tires, rear springs 44 inches long and front springs 36 inches long. The 30-35-horsepower car has a wheelbase of 106 inches, 34-inch wheels with 4 1-2-inch tires, rear springs 44 inches long and front springs 40 inches long. In both models an aluminum pan is placed under the engine and gearcase. Running-boards are covered with rubber and are supported by forged steel brackets attached to the main frames; mud-guards are wide, and are of aluminum, as is also the hood, which is hinged at the top. Under the body at the rear is a compartment with a large drawer divided into separate compartments with places for tools on one side and places for oil and grease cans on the other. The color of the paintwork is optional, as is also the upholstering. Plain leather, however, is recommended by the manufacturers for the seats, owing to its greater durability and cleanliness. The equipment of each car consists of five lamps, irons for top, a tire carrier and a tool box containing a set of tools and extra parts for the car.

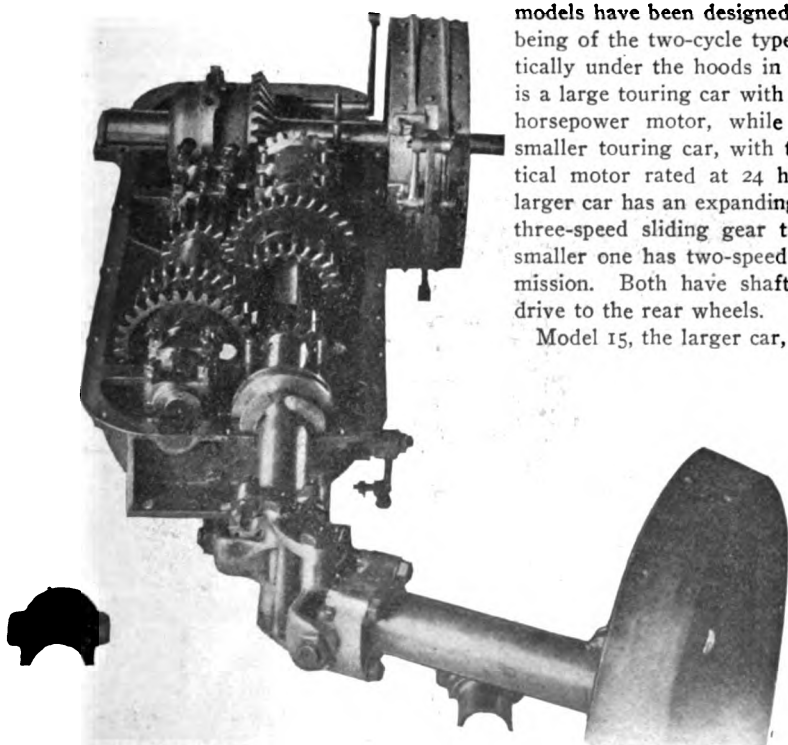
Elmore Two-cycle Vertical-engine Cars.

AUTOMOBILES fitted with two-cycle motors have for years been built by the Elmore Mfg. Co., of Clyde, O., a firm which has devoted itself exclusively to this type of motor. Heretofore the Elmore motors, with single and double cylinders, have been hung under the bodies of the cars. For the season of 1906, however, two new models have been designed, the motors still being of the two-cycle type, but placed vertically under the hoods in front. Model 15 is a large touring car with four-cylinder 35-horsepower motor, while Model 14 is a smaller touring car, with two-cylinder vertical motor rated at 24 horsepower. The larger car has an expanding ring clutch and three-speed sliding gear transmission; the smaller one has two-speed planetary transmission. Both have shaft and bevel gear drive to the rear wheels.

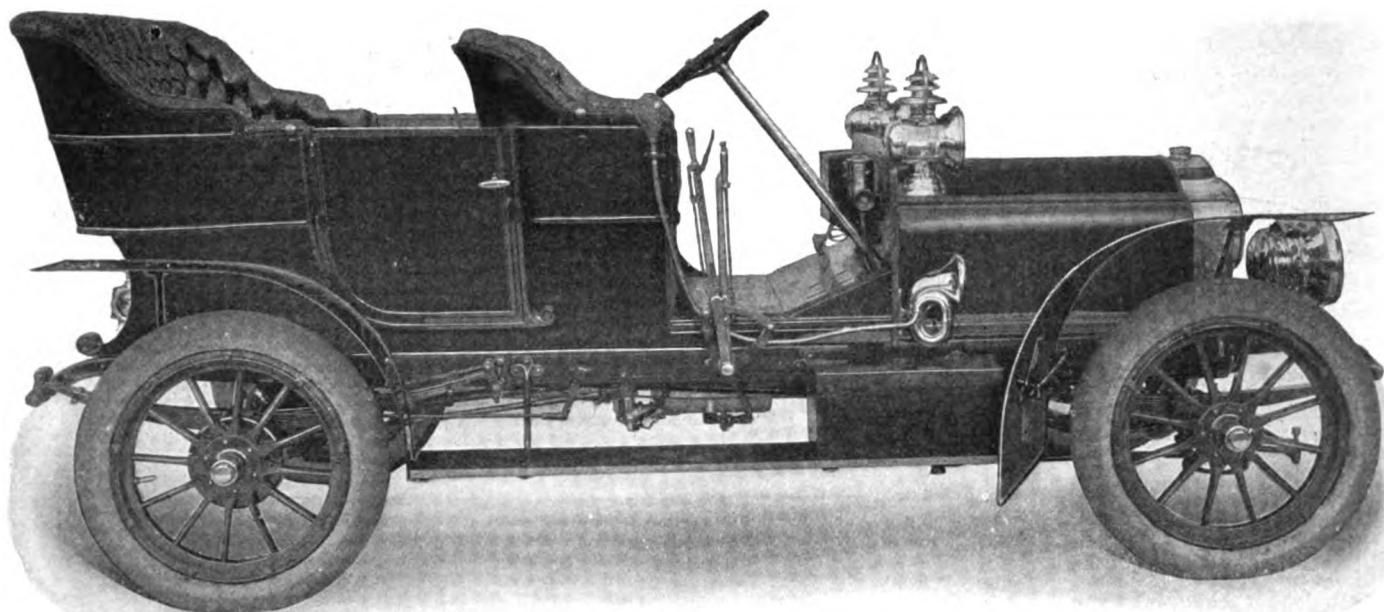
Model 15, the larger car, is a typical large

touring car with side-entrance body, providing plenty of space for the passengers, a wheelbase long enough to give easy riding, in combination with long springs, and a general outline that is at once simple and attractive. Probably the most noticeable feature of the engine is its clear, unencumbered appearance; there are no valves on or connected with the engine, and consequently there is no necessity for gears, camshafts and other moving parts for operating valves. The only gears used about the engine are the bronze bevels, of equal size, which rotate the timer at the same speed as the crankshaft.

The motor operates on the three-port system; this system has already been described at length in *THE AUTOMOBILE*, but it may be said that two ports in the cylinder wall, alternately covered and uncovered by the piston, carry the combustible gases into and the exhaust out of the cylinder; a third port in the cylinder wall, placed low down so as to open into the crankcase when the cylinder is at its highest point, allows the mixture from the carburetor to pass into the crankcase, where it is compressed and later forced through a connecting passage and the inlet port into the cylinder. An impulse is imparted to the crankshaft once every revolution by each cylinder; thus four cylinders give an impulse to the crankshaft every quarter of a revolution, the same as two double-acting steam cylinders, and the same as an eight-cylinder four-cycle explosion motor. This results in smooth running and a steady pull which is of special advantage on hills.



LOCOMOBILE TRANSMISSION AND CLUTCH CONE, ILLUSTRATING DOUBLE UNIVERSAL JOINT IN SHAFT.



NEW ELMORE 35-HORSEPOWER, FOUR-CYLINDER, TWO-CYCLE MOTOR-IN-FRONT TOURING CAR

The cylinders of the four-cylinder Elmore have a bore of 4 1/2 inches and a stroke of 4 inches; the heads are dome-shaped inside and are cast integral with the cylinders, as are also the water jackets. The pistons are fitted with four rings each, one ring being near the bottom; crankshaft is made from a steel forging and has large bearings. Cylinders, pistons and all bearing surfaces are ground. Water piping and other engine fittings are of cast brass. The pump is positive and is rotated by the timer shaft. Lubrication of the motor is accomplished by a Hill precision oiler, and sufficient oil for 300 miles' running, is carried. The carbureter, made at the Elmore factory, is of the Krebs type and, the manufacturers state, will use any grade of gasoline.

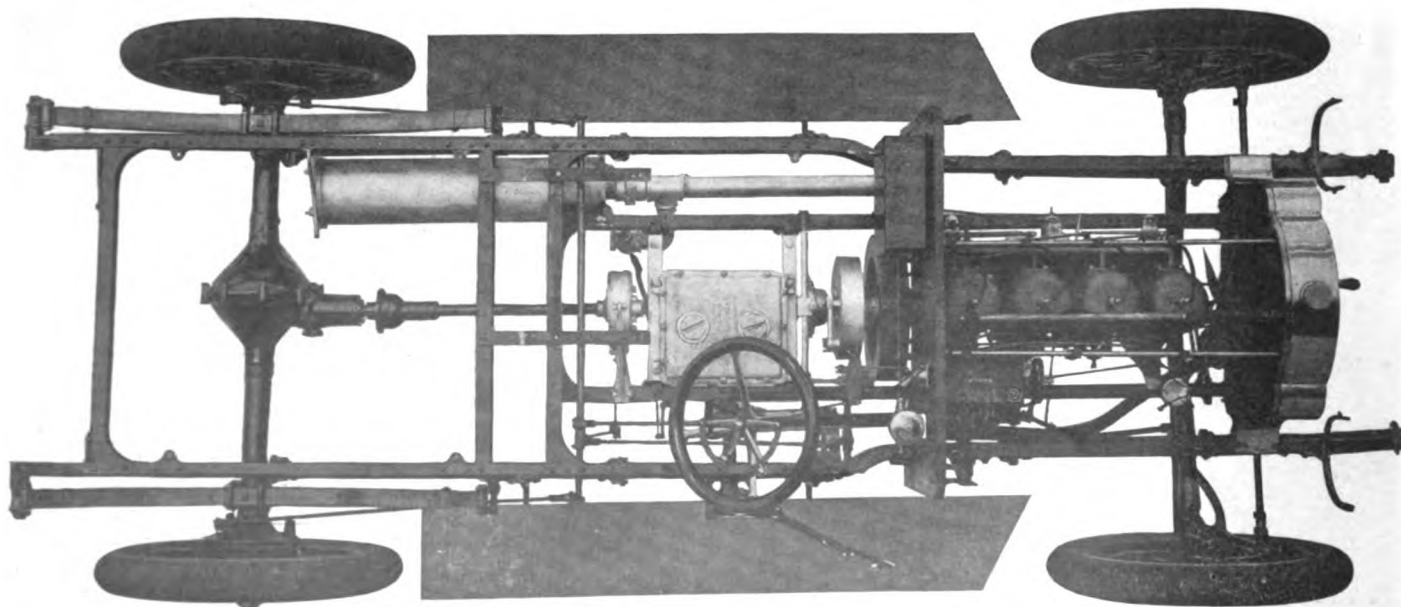
Throttle and ignition levers are placed in the usual position above the steering wheel, but do not turn with the wheel; the throttle

is also connected with the clutch pedal, so that when the clutch is withdrawn the engine is automatically slowed down. A pedal and a side lever control the service brake on the driving shaft and the emergency brakes on the hubs of the rear wheels respectively. The three speeds and reverse of the sliding gear transmission are controlled by a single lever, and an interlocking system prevents the engagement of the clutch when the gears are not fully meshed.

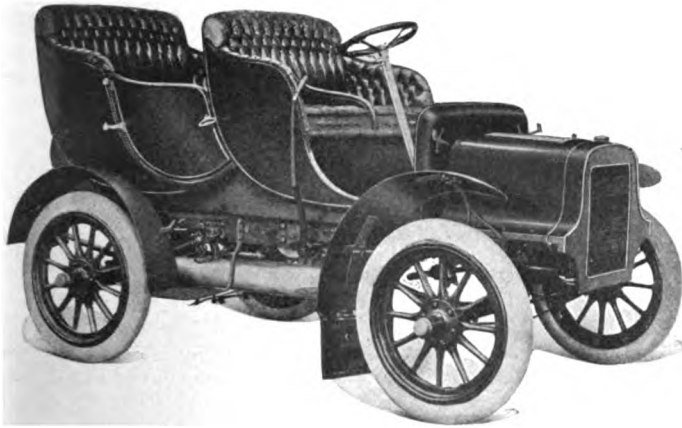
The clutch is an expanding bronze ring and is said to be smooth in action and to require adjustment only at long intervals; it is self-centering, so that it is always well clear of the drum when disengaged. The clutch is placed a few inches behind the flywheel and is a separate unit, the flywheel not being used as one member of the clutch as when the cone type is employed. The transmission shafts run on roller bearings;

a universal joint is interposed between the clutch and the transmission gearcase. The transmission gearcase and the engine are bolted through laterally extending arms to a sub-frame. The propeller shaft terminates at each end in a universal joint, one directly in the rear of the transmission gearcase and the other just in front of the bevel gear casing on the rear axle. The thrust of the bevel driving gears is taken on ball bearings, and the rear wheels run on Hyatt roller bearings. Spur differential gearing, of Brown-Lipe manufacture, is fitted and, with the bevel driving gears, is enclosed in a casing with removable top. The front axle is tubular and the front wheels run on large ball bearings.

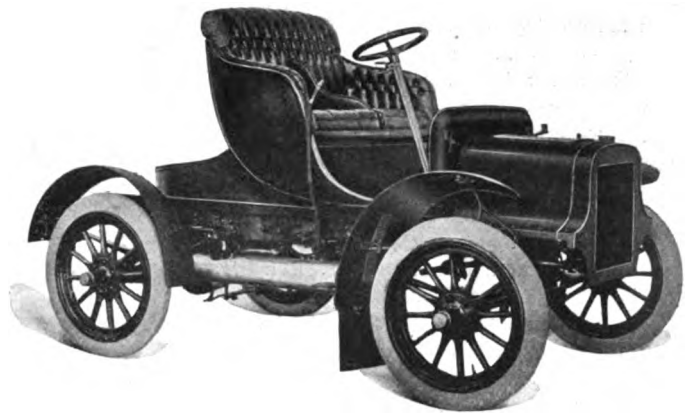
The framing is of pressed steel, well braced and stiffened by heavy gusset plates at the corners, and is narrowed at the front. Special attention is given by the manufac-



ELMORE CHASSIS PHOTOGRAPHED FROM ABOVE SHOWING TRANSMISSION SYSTEM AND SHAFT DRIVE.



CADILLAC 10-HORSEPOWER, SINGLE-CYLINDER LIGHT TOURING CAR.



CADILLAC 10-HORSEPOWER CHASSIS, WITH RUNABOUT BODY AND TURTLE BACK.

turers to the matter of springs. These are all semi-elliptic and two inches wide; the rear springs are 48 inches long and have five leaves, while the front springs are six inches shorter, with the same number of leaves. The manufacturers state that there are five special grades of steel in each spring and that each leaf is graduated in thickness. The leaves are polished all over to avoid internal friction, and clips are fitted to prevent breakage from violent recoils.

The radiator is of the flat tube type, the tubes having radiating fins attached; the tank is combined with the radiator, and the car will run about 150 miles on one filling of water. A twenty-gallon gasoline tank is placed under the seat and connected with the carbureter by a removable copper tube. A metal pan under the engine and transmission gearcase protects those parts from dust, mud and water. The wheelbase of the car is 104 inches and the tread standard. Wheels are 34 inches in diameter, with 4-inch tires of optional domestic manufacture.

In general design and construction Model 14, the 24-horsepower two-cylinder car, is similar to the larger machine. The dimensions are naturally reduced, however, and the machine is, of course, lighter. The engine, placed under the hood, has two vertical water-cooled cylinders of 5-inch bore and 5-inch stroke and operates on the three-port system, the same as the larger machine.

A planetary transmission takes the place of sliding gears, and gives two forward speeds and reverse, with single lever control. A clutch of the same type as that on the larger car is fitted, and is controlled by the same lever that controls the speed gears. The wheelbase is 92 inches and the tread is standard. The body is of the touring type, with side entrances; the tonneau may be removed and a sloping deck or "turtle-back" substituted.

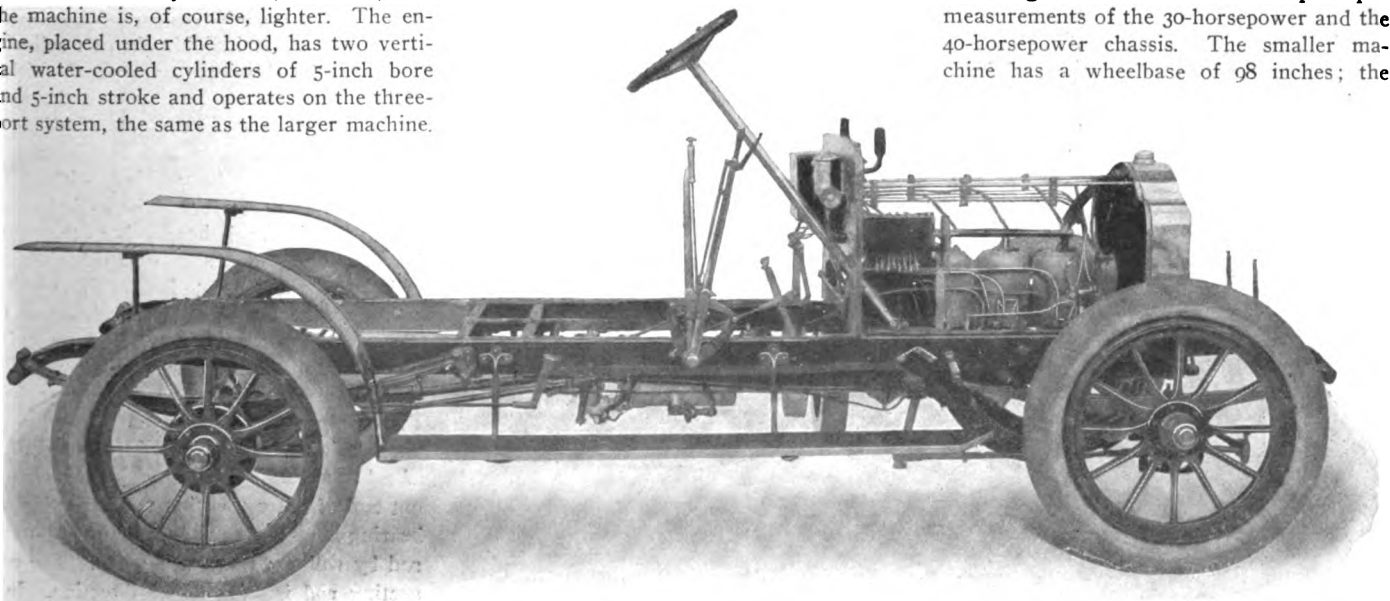
Cadillac Line for 1906.

For the season of 1906 an extensive line of cars will be placed on the market by the Cadillac Motor Car Co., of Detroit, Mich.; no less than ten models will be included in the list. Five of these will be equipped with the well-known Cadillac single-cylinder 10-horsepower horizontal motor, viz.; two-passenger runabout, small touring car, light delivery wagon, folding tonneau car and coupé. The remaining five will consist of four-cylinder cars of the conventional touring type. Model H will be a 30-horse-

power car with accommodation for five passengers; the same chassis will be fitted with a runabout body and with a coupé. Model L will be a 40-horsepower touring car, while the 40-horsepower chassis will also be fitted with a limousine body. The same chassis is used in a number of models, the difference being in the style of body only.

Both the four-cylinder chassis have shaft and bevel gear drive and the special planetary transmission designed by the Cadillac company for these large machines; the transmission differs from the majority of planetary gears in giving three forward speeds. Hess-Bright ball bearings of the non-adjustable type are used freely, being fitted to the rear axle, the road wheels both front and rear, the transmission, and even the engine. Drums on the rear hubs carry both internal expanding and external contracting brakes. The speed of the engine is controlled through a governor. Lubrication is effected by a pump lubricator of Cadillac design, the quantity of oil fed to the bearings being proportioned to the speed of the engine. Ignition is by jump spark.

The cars, of course, differ in size, and the following data will show the principal measurements of the 30-horsepower and the 40-horsepower chassis. The smaller machine has a wheelbase of 98 inches; the



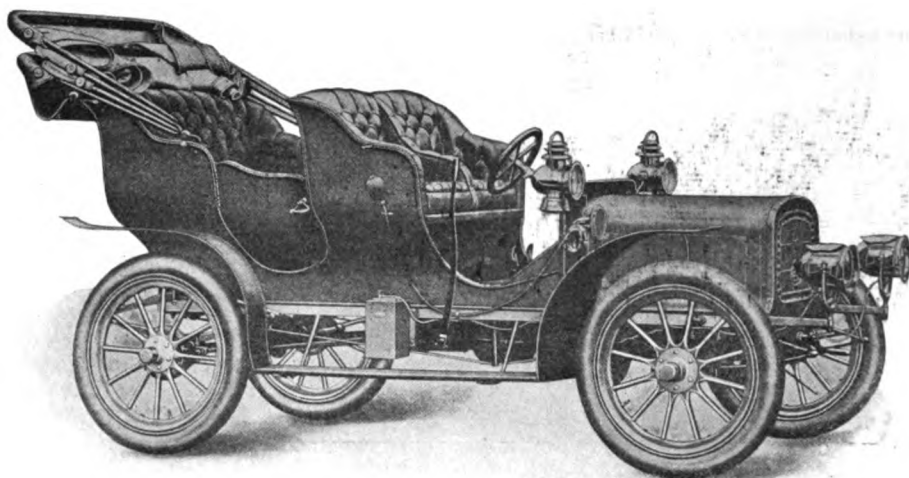
SIDE VIEW OF CHASSIS OF ELMORE 35-HORSEPOWER CAR, SHOWING LOW POSITION OF FOUR-CYLINDER ENGINE

four-cylinder motor has cylinders of 4 3-8-inch bore and 5-inch stroke. Road wheels are 32 inches in diameter and all four wheels are fitted with 4-inch tires. With touring body, the car weighs 2,400 pounds.

The 40-horsepower four-cylinder car has a wheelbase of 110 inches; the motor has cylinders of 5-inch bore and 5-inch stroke. The road wheels are large, being 36 inches in diameter with 4 1-2-inch tires in the rear and 4-inch tires in front; the weight with touring body is 3,000 pounds.

The single cylinder Cadillacs retain the copper water jackets used on former models, two-speed planetary transmission with pedal for applying the slow speed and lever for the high, and safety starting device, by which the insertion of the starting crank retards the spark to a safe point in case it has previously been advanced. Frames are of channel steel. The brakes consist of two friction bands on the differential casing and are applied by a pedal with retaining ratchet. Ignition is by jump spark, two batteries of dry cells furnishing the current; the coil and switch are mounted on the dashboard. Throttle and ignition levers are conveniently placed on the steering wheel column. Axles are tubular, the rear axles being fitted with Brown-Lipe differential gears. Three-point spring suspension is employed, there being two rear springs and one front spring, the latter being attached to the car by a special rocker joint which permits great flexibility. Drive is by a single chain with hardened rollers and detachable links. The front wheels run on ball bearings.

The lower parts of the bodies are finished in black, while the panels and doors are of a deep wine-color with light carmine striping. Dashes are of concave steel.



SMITH FOUR-CYLINDER SIDE-ENTRANCE TOURING CAR, WITH SHAFT DRIVE.

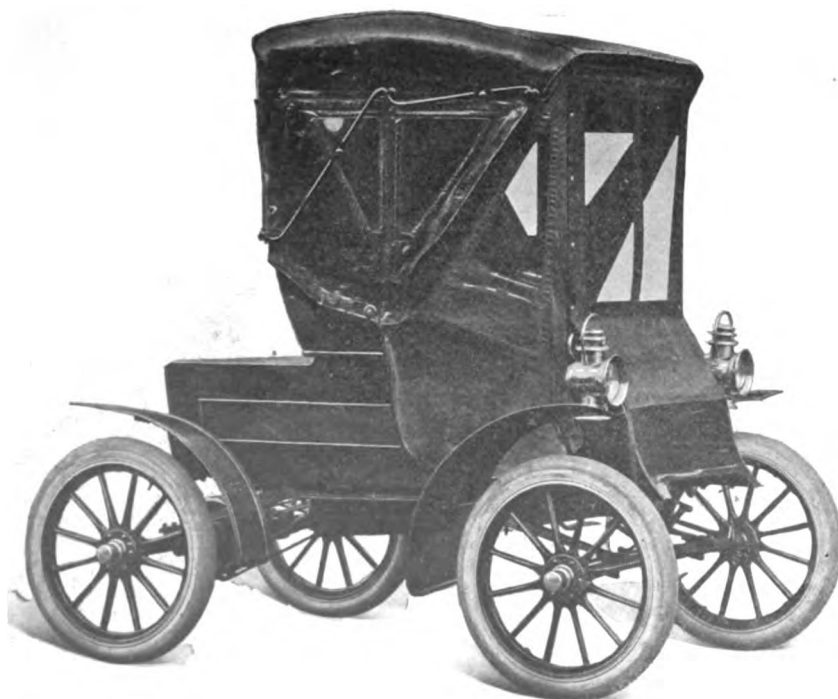
Smith 1906 Models.

Two models, one a side-entrance touring car and the other a side-entrance surrey, constitute the 1906 line of cars manufactured by the Smith Automobile Company, of Topeka, Kan. Mechanically the cars are alike, except that the surrey has a motor of 20 horsepower, the cylinders having a bore of 4 1-4 inches and a stroke of 4 1-2 inches, while the touring car has more power, the motor being rated at 24 horsepower, the cylinders having a bore and stroke of 4 1-2 inches each. In both cases the motor is of the four-cylinder vertical type, placed under the hood in front; the cylinders may be had with jackets for water cooling or with flanges for air cooling. Drive is by special planetary transmission, giving two forward speeds, and propeller shaft and bevel gears to the live rear axle.

The framing is of ash and each main

frame is stiffened by a longitudinal truss extending from end to end and passing under a king-post at the center. The motor is supported at three points; two arms cast, one on each side of the rear end of the crankcase, are bolted directly to the side frames, while the front end of the motor is supported at the center by a bracket bolted to the front cross frame. The transmission gear being of the planetary type, no flywheel clutch is used; a short shaft with a universal joint connects the motor shaft with the transmission. From the rear end of the transmission casing to the forward end of the bevel gear casing extends a steel tube, rigidly connecting these two parts; inside the tube runs the propeller shaft on roller bearings. The front end of the transmission gearcase is supported by a cross frame. Two braces run from the rear axle casing at the points where the spring seats are attached, to the propeller shaft tube about half way between the rear axle and the transmission. The differential is of the bevel gear type; the thrust of the bevel driving gears is taken by roller bearings, and the live shaft and rear wheels also run on rollers.

The motor has individually cast cylinders bolted to the aluminum crankcase, which is divided horizontally and carries the three crankshaft bearings in the upper half; hand holes are provided, so that the interior of the crankcase can be reached without removing the lower half. The cylinders are cast with integral heads, but the water jackets, which are also integral with the cylinders, have separate heads. The jackets surround the cylinders as far down as the top of the piston travels. The manufacturers state that the compression, with full throttle, is ninety pounds to the square inch. Piston pins are of hollow steel; the piston pin bearing of the connecting rod consists of a bronze bushing pressed into the bored-out end of the connecting rod. The big end bearing is of hard babbitt expanded into the rod by rolling; this end is split. The connecting rod is of steel of I-section. Inlet valves are automatic and are placed above



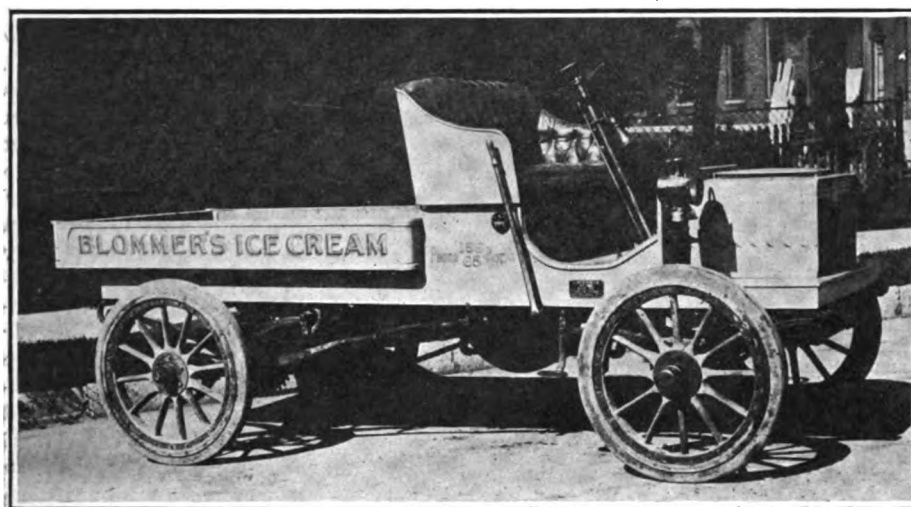
NORTHERN 7-HORSEPOWER RUNABOUT FITTED WITH FOLDING TOP AND WIND SHIELDS.

the exhaust valves on the right-hand side of the engine. To prevent unnecessarily wide opening of the inlet valves the regular valve springs are supplemented by heavier springs which come into play when the valve has reached the proper limit of its opening; the valve is stopped at that point and its stop cushioned by the extra spring. The exhaust valves are operated by cams and push-rods in the customary manner; the exhaust valve housing and stem guide have flanges cast on to radiate the heat and prevent the excessive heating of the valve stem. Ignition is by jump spark; the plugs are inserted in the center of the cylinder heads. A quadruple vibrator coil is mounted on the dash and current is supplied by two batteries of eight cells each. Ignition timing is controlled by a lever over the steering wheel, but not moving with the wheel. Lubrication is effected by a force-feed oiler driven from the engine; the transmission gears run in a bath of oil.

propelled by a double-opposed cylinder horizontal gasoline motor rated at 24 horsepower and has a rated carrying capacity of 3,000 to 4,000 pounds. The car is strongly constructed and weighs empty 3,000 pounds; it is fitted with solid rubber tires on artillery wheels. The over-all length of the wagon is 12 feet 6 inches; the wheelbase is 102 inches. The part of the body available for carrying purposes is 6 feet long and 4 feet wide. The driver's seat is of such width that three persons can be carried.

The manufacturers state that the machine was built for the owner subject to approval after testing, and that the requirements have been fully met; after several months of actual service the car is said to have developed no weaknesses and to have given practically no trouble. The driver was an inexperienced man, but after a day's instruction from an expert had no difficulty in handling the wagon.

The manufacturers state that the success



CLEMICK-HIRSCH TWO-TON, OPEN-BODY DELIVERY WAGON, WITH 24-HORSEPOWER DOUBLE-OPPOSED CYLINDER ENGINE.

Steering is by wheel, the steering post being telescoping; the post passes through the dashboard high up, leaving plenty of foot room. The steering gear is of the worm and sector type. Brakes are fitted to the rear hubs and to the transmission gear, and are operated by pedals.

The wheelbase of each car is 96 inches and the tread 56 inches; wheels are 34 inches in diameter and are fitted with 4-inch tires. The touring car weighs 1,900 pounds and the surrey 1,825 pounds. In the case of the surrey, the rear seat can be removed, converting the car into a runabout with a large rear deck, on which luggage may be carried. The bodies are finished in any color desired by the purchaser, the color not being applied until the car is purchased.

Clemick-Hirsch Wagon.

The delivery wagon illustrated herewith, built by the Clemick-Hirsch Company, of 596 National avenue, Milwaukee, Wis., is

of this machine has caused the owner to order a second and similar one; also that a number of Milwaukee merchants have placed orders for delivery wagons for various classes of work.

Northern Winter Equipment.

The manufacturers of the sturdy Northern runabout have decided to make few changes in this popular little car for 1906. It will still have the 7-horsepower, single-cylinder horizontal motor, planetary transmission and chain drive, giving two forward speeds and reverse. The wheelbase is 66 inches, track 55 inches, and the wheels are fitted with 28-inch by 3-inch detachable tires. Easy riding qualities are secured by the use of the Northern trunnion body hanger. To adapt the car to winter use or in stormy weather a folding hood and wind shields have been designed and the comfortable appearance of the car so equipped can be noted by inspection of the accompanying reproduction of a photograph.

PREPARING FOR SHOW OPENING.

(Concluded from page 5.)

American and foreign cars will be seen side by side, and there will be ample opportunity for making comparisons. More than a dozen foreign makes will be shown, and some of the exhibits will be duplicates of those shown at the recent automobile show in Paris.

Coupon books for exhibitors are now at the armory show ready for distribution. A book containing four coupons for each day of the show will be issued for every twenty square feet of space occupied. Exhibitors will be allowed to purchase tickets in quantities at reduced rates for distribution among friends and customers, and these tickets are also ready for distribution.

The Berlin international automobile exposition will be held from February 3 to 18, under the auspices and joint management of the German Automobile Club and the Association of German Automobile Manufacturers. It will be held in the Landes Austellungs Park, in a building admirably adapted for the purpose and affording 12,000 square meters of floor space all on the same level. The exhibition will be divided into five sections, as follows: 1—Automobiles for the transportation of passengers, and for sanitary, fire and military service; 2—Industrial automobiles; 3—Motorcycles; 4—Power boats; 5—Automobile parts and accessories, auto clothing, literature, drawings and touring maps. Space rental is at the rate of \$7.14 a square meter for main floor booths and \$5.95 a meter for wall space; outdoor exhibition space will be charged for at the rate of \$2.78 a meter. Consul-general Thackara, of Berlin, suggests that in view of the popularity of the American runabouts and electric carriages, the great demand for motor vehicles for industrial purposes, and the decided improvement which has been shown in the construction of the higher grades of American cars, the Berlin exposition will afford a good opportunity for our American manufacturers to bring their products before the German public, and possibly to establish a lucrative and permanent outlet. He suggests that it may be practicable for our manufacturers who are represented at the Paris Salon to arrange for displaying the same exhibits in Berlin. All correspondence should be addressed to Managing Director Freiherr von Brandenstein, No. 16 Leipziger strasse, Berlin, W. Germany.

A dispatch from Portugal says that six tourists, while automobiling near Oporto, plunged down a steep hill and over a precipice, two hundred feet deep, into the River Douro. No trace has since been seen of any member of the party.

Never use fire in any form for warming up the carbureter; the game isn't worth the candle. Use hot cloths or boiling water.

Letter Box

Differentiation of Macadam and Earth Roads on the Topographic Maps.

Editor THE AUTOMOBILE:

[298.]—I enclose a copy of a letter that I have just written to Charles D. Walcott, of the Geological Survey, at Washington, on a subject that should be of general interest among automobilists, as it pertains to the designation of all good hard roads on the United States Survey maps, which would be of great value to tourists. If the idea seems a good one to you, can you not aid in its accomplishment either by publishing the letter or the substance of it?

AUGUSTUS POST.

New York City.

Following is the letter, with a few omissions:

"With regard to differentiating between earth and stone roads and designating the same on the topographical sheets issued by your department, I beg to reduce the matter to the form of a letter in accordance with your suggestion.

"At the present time the differentiation, as I understand it, is between roads used and unused, a double line designating the former and a single line with a parallel dotted line designating the latter.* I would beg to suggest that what is known as a stone road, or a macadam road, be designated by a solid line or in any other suitable manner. The ground upon which I base this suggestion is:

"(1) That the difference between stone and earth is of sufficient importance to be noted, and is of as much importance as the marking of farm houses, churches, etc., and I should even think of more importance than the marking of small rivers and streams, equaling in importance the indication of navigable rivers and railroads. The number of these stone roads is not very large, and the work necessary to ascertain their location would not be difficult. Most of the important facts could be ascertained from the highway commissioners in those states which have this form of road supervision, and in others from the state government or actual field notes which you might have taken when any new work in this regard is projected.

"(2) In regard to the use of such information, I would say that such existing maps as are available are of a very inferior nature and have been given out to fill a very wide demand, especially among those who use the roads for traveling. The various states have issued from time to time maps showing roads constructed or work in process of construction. I enclose a copy of one compiled by the State Engineer's

Department of New York, showing the extent and importance of the work projected within its borders. Massachusetts has issued a similar map, but it is not perfect.

"I beg to refer also to the work in which the American Automobile Association has been engaged during the last summer, that of getting out a series of maps at a cost of some \$12,000, making tracings of the government maps wherever obtainable and making a red plate to go over all the roads which are of a superior character and following the main routes and highways of travel throughout New England and even as far west as Chicago. This immense amount of work was necessary to be done in most cases by personal investigation and actual travel over the important routes so designated. This work of course is supplemented by adequate directions, but if the government sheets had been as accurate in regard to the important highways as they were accurate in designating the byways, wood roads and mere rights of way, almost all of this work would have been simplified, and I think it is not idle to ask that, in view of the large amounts of money spent to improve the roads, they should be recorded upon the topographical sheets as well as on the topography of the country of which they formed a permanent and lasting feature.

"I may say, that, having traveled the National Highway of this country several times and the Appian Way leading from Rome, I have been impressed with the fact that the stone foundation of a road is as permanent and lasting as any of the works of man, and I think more lasting than the beds of some rivers. . . .

"The value of such differentiation of macadamized roads would be inestimable to the users of the roads throughout the country, and, coming at a time when the good roads improvement is becoming such a strong factor in political life, nothing would be so potent as a revealing of the good example set in various parts of the country. However, aside from any political or particular use, I think it would be sufficient merely to ask that stone and earth roads be differentiated in some manner that may seem to you proper."

Owners' Responsibility Defined.

Editor THE AUTOMOBILE:

[299.]—Judge Gaskill, of the Massachusetts Superior Court, has lately made a ruling of much interest and importance to the owners of automobiles. Some of the local district courts have found owners guilty of "speeding," regardless of whether the machine was at the time being run by its owner or was under his control.

The case in which Judge Gaskill overrules this irrational doctrine is worthy of notice. Edward W. Taylor, of Lexington, son of the chairman of the Board of Selectmen of that town, operated during the season lately closed a line of "sight-seeing" (Knox) cars between Arlington Heights

and Concord, passing through Lexington and along the historic Paul Revere route. On the very last trip made, on the last day of the season, the authorities of Lincoln (through a remote corner of which town the route lay) ambuscaded themselves by the side of a measured course, 330 feet in length, and timed the car. A fraction in excess of nineteen miles an hour was the speed alleged to have been made over this extended (sic) course on the up trip and a little more than twenty-two miles an hour on the return.

In the district court at Concord it was shown that the defendant, Mr. Taylor, the registered owner of the car, was not with it at the time complained of, but was in a neighboring town. The car was being operated by one of his employees, who held an operator's license. The venerable judge of that court promptly held that these facts constituted no defence and imposed the maximum fine (this being the defendant's first offence) of \$25 on each count, or \$50 in all.

The case was as promptly appealed by Mr. Taylor's counsel, and on December 15, in the Superior Court, the defendant was duly acquitted, the jury giving their verdict in obedience to Judge Gaskill's ruling that on the facts the owner had committed no offence. The judge said that the owner of an automobile, if present in the car when it is run in excess of the speed limit, *may be* held to be the guilty party, notwithstanding the fact that the machine is being operated by his chauffeur; but that to hold the owner responsible, though absent at the time and not shown to have instructed or authorized the chauffeur to run fast, would be utterly subversive of the fundamental principles of the criminal law. As well, he said, might an owner under such circumstances be held for manslaughter, if the chauffeur wantonly ran over and killed a person in the highway.

Robert P. Clapp, of Johnson, Clapp and Underwood, was counsel for the defendant.

E. W. T.

Lexington, Mass.

Although the automobile dealers have not yet been able to convince the milkmen that an automobile will deliver milk without making butter, the brewery men seem to think that it is a safe and economical proposition to use motor trucks for their purposes. Many of the largest brewing companies both east and west have purchased motor trucks, and, from indications, these are giving satisfactory service. Among other things, the brewers say that no matter how much beer they put into an automobile, its navigating qualities do not seem to be affected. They are always reliable.

"Aw—I have £500 lying idle and aw—think I shall lay out £100 on a car."

"You won't get much for that. Why not more?"

"You see—aw—I thought of reserving the balance for fines."—The English Motor.

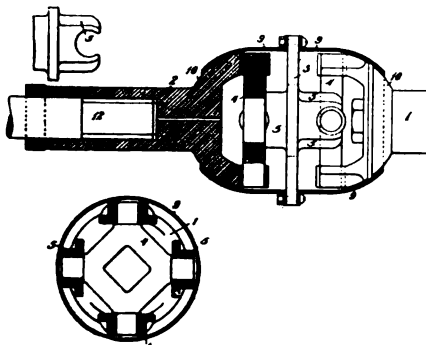
*Wagon roads are indicated on the topographic maps of the United States "by fine double lines, full for the better roads, dotted for the inferior ones, trails by single dotted lines."

Patents

Universal Joint.

No. 806,592.—C. W. Spicer, of Plainfield, N. J.

This is a double universal joint which performs the functions of the Oldham coupling in a somewhat more mechanical manner. It consists essentially of two separate universal joints of the ordinary Greek cross type connected by a forging 5, which performs the function of a short shaft. The drawing shows also a square slip joint 12 for use when the universal coupling forms part of an automobile propeller shaft. The two forgings 1 and 2 are formed, as usual, with the forks 10, in which the Greek crosses 4 are pivoted. The two crosses are pivoted also to the forging 5, which connects them, so that the shafts can run with non-intersecting axle as well as with the



SPICER UNIVERSAL JOINT.

axes intersecting but not coincident. The coupling is made dust-proof by means of the covers 9 9, which are bolted to a central flange 3 on 5.

Revolving Engine.

No. 806,125.—F. O. Farwell, of Dubuque, Iowa.

This patent covers the valve gear and special arrangements generally of the Adams-Farwell air-cooled engine, with stationary crankshaft and three radial cylinders revolving in a horizontal plane around the crankshaft.

Steering Check.

No. 806,684.—H. Lemp, of Lynn, Mass.

This is a modification of the well-known Lemp steering check, the new feature being an arrangement adapting it for use with wheel steering. A small initial free movement of the steering wheel opens the valves in the steering check, permitting deflection of the front wheels.

Gasoline Burner.

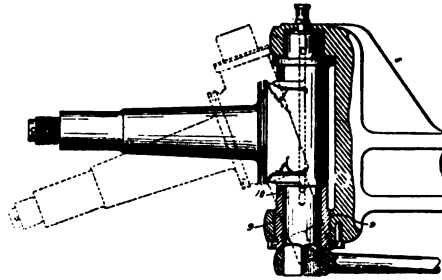
No. 806,308.—R. H. White, of Cleveland, Ohio.

This patent, application for which was filed December 3, 1900, describes substantially the present burner of the White steam car, although with some differences of detail.

Steering Knuckle.

No. 805,716.—A. R. Demory, of Canton, O.

A construction giving a longer bearing at the base of the pivot than is afforded by the depth of the yoke forging at that point. A bushing 9 is threaded into the forging, and its upper portion 10 extends up as far



DEMORY STEERING KNUCKLE.

as desired. To dismount the parts, the bushing is removed, when the knuckle can be drawn down and tilted as shown in dotted lines.

Starting Crank with Automatic Release.

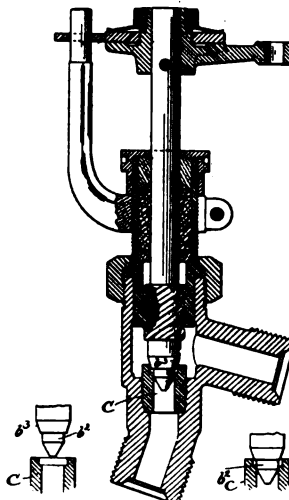
No. 806,583.—G. B. Selden, Jr., of Rochester, N. Y.

This is a starting mechanism in which the crank is pushed axially along its shaft to engage the crankshaft by means of a ratchet in the usual way. The automatic release consists of a roller ratchet engaged by a backward motion of the crankshaft and acting against a pair of cams to push the starting crank out of engagement with the crankshaft. Like all other devices of the sort, it requires a measurable backward movement of the crankshaft to cause it to operate.

Throttle Valve.

No. 806,309.—R. H. White, of Cleveland, Ohio.

This is an improved form of throttle valve



WHITE THROTTLE VALVE.

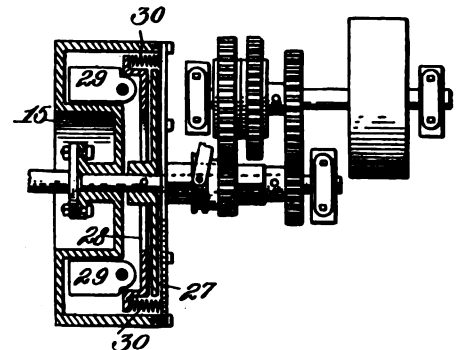
for high-pressure, superheated steam, and its object is to avoid to a large extent the cutting of the valve and its seat by wire drawing of the steam when the throttle is

nearly closed. This is accomplished by dividing the valve into two elements, of which one closes the valve nearly tight, and is so formed as to stand a good deal of cutting before it becomes ineffective, while the second element closes the valve completely. In the drawing the first element is a cylindrical hardened steel plug b^1 , which is a free fit in the hardened bushing C. This plug enters the bushing for an appreciable distance before the conical element b^2 closes the valve completely by seating against the counterbored upper end of C. Consequently it is not necessary to seat b^1 except to stop the vehicle completely, and all ordinary slow running is accomplished by the aid of b^2 .

Automatic Flywheel Clutch.

No. 806,377.—T. L. Sturtevant, of Quincy, and T. J. Sturtevant, of Wellesley, Mass.

This clutch is substantially similar to devices previously patented by the same inventors, whose object is to effect connection between the flywheel and the gears by the automatic action of the centrifugal clutch weighs 29, which are so pivoted that when they expand they press the friction disks 27, 28 of the clutch together. The improvement in the present invention consists mainly in the form of the disks, which are so arranged as see that their external di-



STURTEVANT CLUTCH DEVICE.

ameter is nearly the internal diameter of the flywheel 15, thus making them more effective than when their diameter was smaller. When it is desired to stop the car the engine is throttled or the switch opened, whereupon, as the speed decreases, the springs 30 automatically disengage the disks.

Steering Gear.

No. 806,612.—H. W. Alden, of Hartford, Conn.

A form of tilting steering column in which the reducing gear consists of a steep pitch screw and nut, and the steering column is tilted approximately about the trunnions which connect the nut to the bell-crank forging.

Mysterious obstructions in the supply pipe are sometimes caused by water in the gasoline collecting at a low point or pocket and freezing.



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**Outlook
for
1906.**

The year 1906 opens upon conditions which are extraordinarily favorable to the American automobile industry. In the first place, the country is in a state of unparalleled prosperity, and the manufacturers have prepared to take advantage of this by having on the market, earlier in the season than ever before, the finest array of cars that has been seen in this country—cars that appeal to the prospective purchaser. For the first time practically all the manufacturers have placed their 1906 models on the market well in advance of the great shows, to which both builder and buyer have hitherto repaired to see what was new for the coming season. This certainly indicates a greater degree of confidence than has been displayed in former years.

The distributing centers for automobiles and for information regarding automobiles—the garages and salesrooms—have multiplied in number and increased in importance exceedingly; the old-established houses have expanded and erected buildings that are far in advance of anything of the kind in existence a year ago, while the newly established dealers profit by the accumulated experience of their predecessors. They handle better cars than have been hitherto built in this country, and sell them to appreciative buyers, whose knowledge of cars is greater than ever before. The increased number of distributing centers means an

increased and more widespread knowledge of the automobile, so that 1906 will doubtless see a more rapid decrease of unreasonable prejudice, born of ignorance, than any previous season.

Activities in kindred lines of industry, which have been directly influenced by the development of the automobile, are also conspicuous. As an instance, the application of the explosion motor to the propulsion of railroad cars may be mentioned. Judging by the success that has attended the work carried out along this line, a new outlet for the energies of the motor builder has been found. There is also a constantly increasing demand for high-class motors for boats.

Owing to the widespread knowledge of the automobile and its uses, the accumulated experience of the builder and his knowledge of conditions, and the readiness of the merchant to take advantage of a profitable aid to business, the prospects for the development of the commercial vehicle—a field hitherto almost undeveloped—are better than ever before, and preparations for the occupation of the field are also far in advance of previous years.

Another great opportunity of the coming year is the foreign trade. For a long time the American builder has had so much to contend with that he has been content to confine his efforts almost wholly to his own country; but the opening of the year 1906 finds American cars so much better in every way than in any previous season that it is not surprising to find American builders placing their cars in foreign markets in open competition with the European machines. The American builder has a logical right to take a high place in export trade, for his cars have had to stand up to the same conditions of rough roads and generally adverse conditions that they will meet in India, for instance, or Australia, or South Africa, and are therefore eminently qualified to give satisfactory service.

As the year 1906 opens, the American manufacturer finds himself better equipped with experience than ever before—experience born of struggles against conditions that have brought his car to a necessarily high standard. With better cars, better facilities and a far wider field for 1906 than ever before, it will be strange if the new year does not prove to be the most prosperous that the automobile industry has yet experienced.

**No Charges
Against Race
Commission.**

Mail reports from Paris printed this week show that no official charges have been made against the Vanderbilt cup race management by the international meeting of automobile clubs. We had really expected that this would prove to be the case when the foreign letters were received here, and the news will be received with satisfaction by those who have hoped for friendly international relations in automobilism. It

is known, unofficially, that there was some excited comment on the management of the race made during the meeting by disgruntled or misinformed persons, a circumstance not at all surprising and likely to occur anywhere in any similar gathering. In these views the committee of the whole manifestly did not concur, and it would not be fair to the committee to give the impression that a wholly unauthorized and fragmentary newspaper report of the meeting was the deliberate expression of that body.

That there was a misunderstanding as to the status of the Automobile Club of America in connection with the race, and as to the conditions of the deed of gift, on the part of the German club, is shown by the statement of Count Stierstorff. This statement, however, was met by the polite assurance of the American delegates that the matter would be laid before the Automobile Club of America; so that a friendly explanation and the consequent elimination of any cause for ill feeling is a certainty. It might be an opportune time for the A. C. A. to explain minutely to the associated international clubs its relation to the sport of automobile racing in America.

**The Auto in Its
Commercial
Aspects.**

An aspect of the automobile industry frequently lost sight of by the public in the contemplation of the automobile itself, but which is brought forcibly to attention by the erection in New York and elsewhere of a number of fine buildings devoted exclusively to the automobile, is the permanent investment involved in the marketing of the machines—an aspect that has only recently assumed large proportions in this country, but is rapidly and steadily growing, of necessity keeping pace with the development of the automobile itself.

When the automobile first came into commercial existence it was as an auxiliary, of doubtful merit, to some other line, and the accommodations required and provided for the housing and sales of cars were such as could be spared most conveniently. As the industry grew and more room was required, other lines became in many cases auxiliary to the automobile and were finally abandoned and the automobile was handled solely on its own merits. When this point was reached, special repair shops, storage rooms, salesrooms and garages became necessary; but the proportions assumed by the business at this time did not warrant the erection of special buildings, so that premises abandoned by other pursuits were necessarily secured. In many cases buildings formerly occupied as livery stables were found to provide the greatest possible clear floor space for storage and garage purposes. These, however, were obviously unsuited for showrooms and offices, and this led to the practice of having offices and salesrooms in one place and garages and storage space somewhere

No Gordon Bennett Cup Race in 1906.

(From Our Own Correspondent.)

else. The still increasing automobile business made it necessary in many instances to remodel old buildings and even build modest additions; and in some instances really excellent establishments were the result of the practical rebuilding of structures originally intended for other purposes.

Only recently, however, and with a swiftness that has been a surprise to those who are not closely in touch with automobile matters, the business has reached such important proportions that heavy, permanent investments are warranted, and as a result, the really fine buildings, completed and in the course of erection in New York and, to a proportionately lesser extent, in other cities, are seen. Two of the prime requisites in a building devoted to the automobile business are large, unobstructed floor areas, so that the machines can be conveniently handled and stored, and immunity from danger of fire. Both these requisites call for expensive methods of construction, so that the capital invested is necessarily large in proportion to the size of the building. Again, the matter of location is of no small importance, and the building sites selected are now in localities where real estate is expensive, so that the investment is accordingly heavier.

In New York automobile dealers have apparently selected as most desirable the district in the neighborhood of Columbus Circle, at the southwest corner of Central Park; and here block after block is occupied mainly by garages—fire-proof structures with enormous clear floor areas, with street fronts composed of huge sheets of plate glass; buildings notable for their suitability to the business and for their fine appearance. As an indication of the fact that ample capital is available for such enterprises, it may be mentioned that the plan of building beyond present requirements and leasing the extra space has also been followed.

The effects of all this are far-reaching, extending beyond the limits of the automobile business. Necessarily substantial and usually handsome business buildings, attracting a substantial class of customers to a locality, the garages add to the attractiveness of the districts they occupy and enhance the value of neighboring real estate.

The Paris sporting daily, *L'Auto*, has delegated George M. Dupuy to act as its American representative on automobile matters. M. Dupuy, who is well known as a sportsman and explorer, has established his headquarters in the Dun Building, New York, and will contribute articles to his home paper dealing with the industry in this country.

The order issued in London last season closing Hyde Park to all electric, gasoline, steam or other automobiles and cycles between the fashionable hours of 4 and 7 P. M., during May, June and July, has been modified for next year, when electric carriages will be permitted within the park.

PARIS, Dec. 20.—At the meeting of the international association of recognized automobile clubs, held here on Monday, it was voted unanimously that the Gordon Bennett Cup race should not be run in 1906. The Automobile Club of France will retain the cup at its headquarters during the year. Baron de Zuylen, the president, announced to the meeting that the Automobile Club of Italy had sent in a challenge for the Gordon Bennett Cup for 1906, and after a discussion, in which the delegates from the clubs of France, Austria, Germany, Portugal, Switzerland and Belgium declared their clubs would not compete in 1906, the vote was taken. Owing to there being no Gordon Bennett race, the international meeting, instead of being held twice a year, will not be held until the month of December, four or five days after the opening of the Paris show, contrary to the decision of the first conference of June 20, 1904.

This information is contained in the official report of the meeting which has just been given to the press. The delegates met at the Automobile Club of France on December 18. America was represented by J. Howard Johnson and W. S. Hogan, and delegates were present from Germany, Austria, Belgium, Spain, Great Britain, Italy, Portugal, Switzerland and France. Baron de Zuylen, who was unanimously elected president, expressed the deep regret of the assembly at the death of Clarence Gray Dinsmore, delegate of the Automobile Club of America, who had always shown the deepest interest in and devotion to the cause of automobilism.

On the proposition of the British delegate it was decided that in future propositions from any automobile club should be sent to the headquarters of the International Association of Automobile Clubs, Paris, in order that they may figure on the date and communicate with the other clubs at least ten days before the meeting.

After an exchange of views the conference decided that the dates of all automobile events organized by the different clubs forming the international association should be sent direct to M. Ward, secretary of the international association of automobile clubs, who will transmit them to the calendar commission as far as possible before September 1 of each year, so that this commission might submit its work to the international association before December 1.

It was decided unanimously that all international questions concerning motorcycle clubs should be centralized and treated by the recognized automobile clubs, and that no international correspondence should take place outside the recognized clubs. It was also unanimously decided that every disqualification pronounced by one club against a driver, a society or a firm should

be notified the same day to all other clubs by telegraph and confirmed by registered letter. The disqualification must take place immediately and every club must acknowledge the receipt of the notice. It was decided that all disputes on races should be settled by the rules of the races, and that all objections must be substantiated by documents from the officials.

The German club had sent in a proposition for one annual automobile race, the expenses of which should be covered by each club, but Count Sierstorff announced that they would withdraw it for the present.

The president was given power to admit the automobile clubs of Sweden and Roumania as soon as the rules and list of the committee of these two clubs shall have reached him.

The question of the suppression of the 10 per cent. discount given by certain tire manufacturers and constructors to chauffeurs was discussed without any decision being arrived at.

Count Sierstorff referred to certain measures which had been taken during the Vanderbilt Cup race of 1905 without the approval of the official delegates of the Automobile Club of Germany. Messrs. Johnson and Hogan, representing America, took note of these observations and gave assurance that they would communicate them to the Automobile Club of America.

The American, Austrian, Spanish, British, Italian, Portuguese, Hungarian and French delegates, in view of the vexations caused to automobilists visiting Switzerland, advised the owners of automobiles as well as their friends to avoid visiting Switzerland. At the same time acknowledgment was made of the good intentions of the Automobile Club of Switzerland.

The Automobile Club of Italy was unanimously admitted to the international association, and the conference closed with an appeal from the Marquis de Dion for co-operation on the part of other clubs during the European Circuit of 1906.

Although not mentioned in the official account of the meeting, it is understood that a new conference will be held during July next to decide whether the Gordon Bennett race shall be run in 1907 or whether it shall be definitely abandoned. The opinion among the delegates is that the Gordon Bennett event is dead and buried, and one of the Austrian delegates probably voiced the general opinion when he declared that the Gordon Bennett Cup was "an interesting object for the museum."

From an interview with one of the most prominent members of the French club immediately after the conference it was learned that the Automobile Club of America was criticised, and the organization of the Vanderbilt Cup race of 1905 also by some of the delegates. No official vote appears to have been taken on the matter,

however, and the brevity of the mention in the report is confirmatory of the declaration of the French delegate referred to that the subject would probably not be mentioned in the official records of the meeting.

INTERNATIONAL TOURING CONGRESS

The international congress on automobile touring, held during the Paris Automobile Show, brought forth reports, papers and discussions on practically every subject of interest to automobile tourists. A paper was read on the conduct of touring competitions, and means for reaching accurate conclusions were discussed. It was proposed that in order to secure uniformity in touring events every club should submit its rules to the A. C. F. before publishing them. It was proposed by another delegate that the A. C. F. should draw up a calendar of automobile events and that clubs desiring to hold contests should notify the A. C. F. at least sixty days in advance; and that the A. C. F. should give preference, in making up the calendar, to the early applicants. Another member proposed that France should be divided into sections for touring purposes, each section to have a central headquarters from which information would be disseminated, the division centers to report to a main headquarters; all the headquarters to be under the control of the A. C. F.

Road improvements were discussed at length and dust-laying compounds considered. All nations were urged to improve their roads and so widen the field of usefulness of the automobile both for commerce and pleasure. An active boycott of Switzerland was urged upon tourists. The perfect touring car and its equipment were discussed. The question of posting road signals was referred to, and the proposition made that the work be divided between the A. C. F. and the Touring Club of France.

Other subjects discussed were the automobile traffic of towns; rules of the road, of which a complete code was read and the proposition made that the code be adopted by France and all automobilizing nations, and that a knowledge of the code be made an essential qualification of applicants for driving licenses; hotel accommodations, during the reading of which paper it was stated that 1,200 hotels had adopted the model bedroom suggested by the A. C. F.; the issuance of driving certificates and the conduct of automobile schools, it being suggested that schools give two grades of certificates, an ordinary and a higher grade; lights on automobiles; the influence of newspapers on automobile touring; legislation and taxes, the suggestion being made that automobilists be allowed to drive at any speed they choose, being, however, responsible to the common law for any resulting trouble; and maps.

Cars infrequently used should be jacked up to take the weight off the tires.

Calendar Congress Schedule.

PARIS, Dec. 20.—The Calendar Congress held here yesterday arranged a schedule of dates for 1906, which, however, is merely a friendly arrangement and is neither final nor official. For 1907 the conditions will be changed, as all dates for that year will have to be definitely fixed by the Congress, which will meet in December, 1906.

About fifty delegates were present at the Calendar Congress held at the Automobile Salon yesterday, all the French automobile societies being represented. Foreign organizations were represented by Lionel Currie and W. Morris for the Motor Boat Club of America; Col. H. C. Holden and Lindsay Lloyd for the Automobile Club of Great Britain, and there were delegates from the Belgian, Austrian and Italian clubs.

The Automobile Club of France, although responsible for the calling together of the conference, was not able to fix the dates of its own important events, the Grand Prix and the endurance test over the European Circuit. These two events will be run during June and July and will probably cause some changes in the calendar for these two months.

Considering only the events of international importance, the 1906 season opens with the Brussels show in January, followed by the Berlin show in February. The Cannes fortnight and the Nice week are down for the month of March. April opens with the great Monaco meeting and the cruise from Toulon to Palermo. In May the first race for the Targa Florio will be decided; June sees the Herkomer Cup, the regatta at Kiel, and probably the endurance test organized by the Automobile Club of France. For the same month there is on the program an extraordinary contest for heavy wagons from Paris to London, organized by a French automobile journal, and which will probably never get beyond the initial stage. In July there is the French maritime week, the Ostend meeting, and probably the Grand Prix of the Automobile Club of France. The Ardennes Circuit, the Brescia Circuit, the Trouville Cup and the British maritime fortnight fill up the month of August. In September there is the Florio Cup, motor boat meeting at Arcachon, Mount Ventoux hill climb, and a road race for the Autocycle Cup of France. Chateau-Thierry and Gaillon hill-climbing tests occur in October, the Berlin Salon in November and the Paris Salon in December.

PARIS TOWN CAR COMPETITION.

PARIS, Dec. 21.—The Town Vehicle Competition was run to-day over a total distance of sixty-two miles, on streets that were greasy and caused several minor accidents, but nothing serious. Out of thirty entries twenty-seven started, nine electric and eighteen gasoline cars. Two American entries were barred out at the last moment

because the jury decided that they were not within the classification of town cars; these were an Oldsmobile runabout and a Columbia electric runabout. Speed did not count in this competition, only regularity of running, elegance and economy of fuel consumption being taken into consideration. Twenty cars finished within the time limit specified; the winner, however, cannot be named until the points made by the cars have been worked out by the jury.

Foreign News Notes.

Much to do about nothing! As soon as the French constructors desired a speed event the A. C. of France hastened to accede to their request in spite of the quires of paper that have been covered with the reasons why no speed contests would be held in 1906.

* * *

Half a dozen leading Italian professional drivers, as Lancia, Cagno, Nazzaro, Cerano and Raggio, have been presented with medals by the Turin A. C. for their services in bringing the Italian industry into the front rank.

* * *

The Sixth International Motor Show, arranged by the Austrian A. C. takes place in the Horticultural Hall, Vienna, from March 15 to 28.

* * *

A new touring competition is to be added to the already long list of forthcoming events, in the form of a 4,000-kilometer tour Gold Cup of Milan, to be arranged by the Milan A. C.

U. S. Consul McNally, of Liege, furnishes a report on the value of Belgium's trade in automobiles, motorcycles, and bicycles from 1901 to 1904. In 1901 the total value of these machines exported was \$542,428, and in 1904 \$1,316,035, an increase of nearly \$800,000 in four years. The value of automobiles advanced from \$192,000 to \$437,000, and motor cycles from \$70,465 to \$660,538. It appears that the exports were twice as much as the imports. In 1901 the total value of imports was \$369,000 and in 1904 \$669,000. It appears from the tables furnished by the consul, that in four years the exports of bicycles fell from 3,529 machines to 713, while the imports advanced from 2,967 to 5,417 in the same period. The exports of motor cycles advanced from 134 to 2,393, while the imports increased from 49 to 136. Germany is the principal competitor, as that country sends in a cheaper machine than the Belgian manufacturers produce. Of the 5,417 machines imported into Belgium in 1904 3,784 came from Germany, which is about 70 per cent. of the total. The Belgian manufacturers complain also that the duties of the various countries are almost prohibitive, while the Belgian duty is but 12 per cent. ad. valorem.

Growth of Massachusetts Registrations.

Boston, Jan. 1, 1906.—That the registration of automobiles and the licensing of operators by the state is a very profitable business in Massachusetts is indicated by the figures of the automobile department of the Massachusetts Highway Commission for 1905, which will appear in the forthcoming annual report of the commission.

The books of the department for 1905 were closed last Friday, and up to that date there had been received in fees and turned over to the state treasurer the sum of \$24,490.50. This is \$5,000 in excess of the income during 1904, and more than \$7,000 greater than the income during 1903, the first year of the operation of the registration and licensing law. The money is derived from fees of \$2 for each automobile or motorcycle registered, and each ordinary or professional chauffeur's license granted, fees of \$10 each for each manufacturer's or dealer's registration, and fees of 50 cents for each professional chauffeur's license renewed.

A new high mark was reached in 1905 also in the number of automobiles registered. Up to the close of the year 1903 a total of 3,241 automobiles and 502 motorcycles had been registered. For the year 1904 the figures were 3,772 automobiles and 489 motorcycles. During the twelve months just finished, however, a total of 4,889 automobiles and 533 motorcycles have been registered. The registrations of manufacturers and dealers have grown in proportion. In 1903 there were about 100 of these and about 100 have been added each year since. There are now in the state approximately 12,000 automobiles, the highest number plate being 11,661 and the highest manufacturer's or dealer's plate being 0282.

There are now 11,230 persons authorized to operate automobiles in Massachusetts in addition to several thousand professional chauffeurs. Last year 3,736 new ordinary operators' licenses were granted; in 1904 the number was 3,585, and in 1903 3,907. The 1903 figures, however, included all the operators there were in the state up to that time.

The growth of automobilism is demonstrated in the number of persons who have taken up the profession of chauffeur. When the report of the Highway Commission was issued on January 1, 1904, there were only 692 professional operators of automobiles in Massachusetts. In the ensuing year 1,335 more were licensed, and during 1905 2,362 persons were given credentials under which they may operate for hire. In addition to this, during 1905 the Highway Commission renewed 724 professional licenses which had expired.

AUTO FIRE ENGINE FOR NEWARK.

NEWARK, Dec. 30.—At a special meeting the Newark Fire Commissioners decided to

order an automobile fire engine, and the contract was awarded to the Amoskeag Fire Engine Company.

The engine, which will be the first of its kind in this section of the country, will cost \$9,000, and will be delivered within the next four months. It will weigh 19,000 pounds, and its builders claim that it will pump five tons of water a minute. The fire commissioners went to Boston last week to witness a test of a similar piece of apparatus, which made a mile in three minutes, turned in its own length of sixteen feet, and stopped in its own length when going at full speed.

The engine will, in all probability, be stationed in the center of the city. It will be able to throw four streams at one time. It is propelled by steam, and it will be necessary to keep about eighty pounds of steam up while it is in quarters.

It is calculated that extra expense for additional steam pressure will amount to \$75 a year. The present cost of feeding and caring for three horses is about \$500 a year, and the commissioners feel that the auto engine will be a money saver in the end.

PAID DOUBLE DUTY.

Collection of Duty on Reimported Huntington Panhard Held Legal.

BUFFALO, Dec. 30.—Judge John R. Hazel, of the United States District Court of this city, to-day handed down a decision which is of interest and importance to automobilists, especially those owning foreign-made machines. The case was an action of J. T. B. Hillhouse, of New York, against the United States to recover the assessment of 45 per cent ad valorem duty on a machine brought to New York from France. The automobile is owned by the widow of the late Collis P. Huntington, of New York, and the action was brought by Mr. Hillhouse as agent for the estate of the deceased.

The automobile is of Panhard-Levassor make, 1901 model, limousine body, and is valued at \$24,000. It was originally imported from France in 1902 and the duty was paid upon it. In August of 1903 the machine was exported to France, but after first being registered at the New York customs house to avoid payment of duty on its return to this country. While abroad, however, the machine was subjected to extensive repairs. The motor was overhauled, new parts substituted in place of old, and the body had been repaired and newly upholstered just prior to the return.

The Huntington estate claimed the machine should be admitted free of duty, but on its entry at New York 45 per cent. was assessed. Objection to the assessment was made, but the Board of General Appraisers at New York upheld the customs collector.

Judge Hazel holds that the duty was proper and says:

"The conclusion is sound, I think, that the machine while abroad received such extensive repairs as to improve it materially in condition beyond its condition when exported. The decision of the Board of General Appraisers is approved."

This decision compels the second payment of duty on the machine when imported. The duty of 45 per cent. upon the invoice of \$24,000 is \$10,800. Judge Hazel heard the appeal in this case while holding a term of court in New York several weeks ago.

SEATTLE-TACOMA BOULEVARD.

SEATTLE, Dec. 29.—The construction of a permanent boulevard between this city and Tacoma is the object sought to be attained by instructions given County Surveyor Valentine by the county commissioners. Surveying for a route is to be commenced immediately.

There is at present a road between the two cities, but it is not in the best condition. The cities are about thirty-five miles apart by road, and much of it is picturesque, although not on the same scale of grandeur as the road to Mount Tacoma. The purpose of the new road will be more for the diverting of traffic to the two cities, although it will prove a valuable addition to the Mount Tacoma road, with which it will connect directly.

The new road is to be macadamized and will be the first scientifically constructed wagon road in King county. It will be known as the Seattle-Tacoma boulevard, and the Good Roads Association advocates it as a beginning of a pike to extend from the Canadian border at British Columbia through Washington, Oregon and California to the Mexican boundary line.

The road records of King county are at present in bad shape, but the Good Roads Association of the county has now taken the matter up in an energetic manner, and County Surveyor Valentine has already commenced the work of getting them into shape, and preparing a map showing the 1,200 miles of roads in the county. This data will further be used in the extension of the proposed pike. It is recognized that this work must be done systematically. At present, roads do not exist where records show them to be located. From this it can be seen that a vast amount of detail work is before the county surveyor. But now that the work has been undertaken, it will undoubtedly be pushed to a satisfactory completion, and should prove very valuable to the automobilists.

PHILADELPHIA LICENSES HELD UP.

PHILADELPHIA, Dec. 30.—Local automobilists were overjoyed to-day when Chief Justice Mitchell, of the Supreme Court of Pennsylvania, issued a supersedeas at the request of Ira J. Williams, representing the

Automobile Club of Philadelphia, restraining the city authorities from issuing city automobile licenses until his tribunal has heard argument in the case. This may mean a temporary lull in the legal battle of at least six weeks, as the Supreme Court's next session is not due until the middle of March. Attorney Williams has, however, asked the court for an early hearing, and it may be that Chief Justice Mitchell will grant the request.

This means that the new state law goes into effect here Monday and that the city must keep hands off the automobilists until the court hears the case and passes judgment. The plan of the club to have one of the members arrested for not displaying the municipal tag is, of course, postponed for awhile, and if the club wins it will be for the city to make the next move. If the court permanently restrains the city from issuing licenses the latter will, in all probability, give up the fight, for almost all the interested parties are of the opinion that the state law was intended to supersede the numerous local ordinances with their manifold provisions as to speed.

Meanwhile the state is issuing licenses and getting the fees, while at the Bureau of Boiler Inspection, in the City Hall, the work has ceased.

AUTO TOURNAMENT ON THE ICE.

MUSKEGON, Mich., Dec. 30.—One of the most peculiar automobile events ever held in the State is planned by the Muskegon Automobile Club for the latter part of February. This is an automobile tournament on the ice of Muskegon lake, so-called, but which is really the harbor on Lake Michigan at this point. The lake is five miles long, and a straightway track will be laid on the ice for that distance. Arrangements have been made to spread hot cinders on the ice, making a path about forty-eight feet wide. The heat of the cinders will cause them to become firmly implanted, and it is expected that this will form an excellent track.

The automobile club will secure the sanction of the A. A. A., says Dr. C. J. Dove, the president, and will endeavor to make the affair one of the biggest and best ever held in the State. The events, which will be from one to five miles, will be open to all.

Besides the automobile races, there will be motorcycle events in which members of the local motorcycle club will probably contest with outsiders. A silver cup and other prizes will be offered.

A motorist in Bavaria has had to appear before the authorities at Munich on the ground that he had used a trumpet to give warning of his approach, instead of the more usual horn, blown by rubber "pear." He argued that, though the law stated that a horn was necessary it did not define how the horn was to be blown. After a long discussion he was acquitted.—*Exchange*.

CHICAGO CLUB TO BUILD.

Papers Signed for Site Outside of "Loop." —Spring Touring Race

CHICAGO, Dec. 30.—At a meeting of the Chicago Automobile Club directors on Friday it was definitely decided to erect a new clubhouse, but the details are withheld owing to complications which may arise over the real estate matters. It is known, however, that the new building will not be put up inside of the elevated railroad loop. A full attendance marked the meeting, the first time that such a thing has occurred in months. Ira M. Cobe, former president of the club, presented the report of the clubhouse committee and it was approved. The necessary papers were also signed, so that matters have come to a head at last. Plans for the building will be made by B. H. Marshall.

A touring race will be held in the spring which is of interest not only to local automobile enthusiasts, but to automobilists in general. Jerome Ellis, a director of the Chicago Automobile Club, is making elaborate plans for the event. It will be a contest for touring cars for a \$1,500 cup, which has been presented for the event by E. F. Meyer, a member of the club. The run will be either from Chicago to Milwaukee, or from this city to South Bend, Ind., and the cars must be fully equipped and must carry four passengers each. Mr. Ellis also offers a cup to be presented to anyone who breaks his (Mr. Ellis's) records to either of the two cities. His record to Milwaukee stands at 3 hours 31 minutes, and to the Indiana city at 3 hours 35 minutes. The race is scheduled to come off May 1.

HAD AN AUTOMOBILE SUPPER.

PHILADELPHIA, Jan. 1.—There is a jovial body of young men in the Union League of Philadelphia who have formed an inner organization called the Hearth Club. They meet at intervals to eat and talk, and as the majority of them are automobilists, their last meeting of the year, held last Saturday night, took the form of an automobile supper. The table was so constructed as to represent a long car. The president of the club, Herbert Darlington, was at the wheel, while the guests occupied the long running board at either side of the car. The waiters were rigged out in chauffeur's rig, and a lot of fun was had listening to the impromptu speeches on things automobiling and the merry jokes of a black-face troupe of entertainers.

MINNEAPOLIS FLORIDA SPECIAL.

MINNEAPOLIS, Dec. 30.—Reservations for the special train that the Minneapolis Automobile Club is going to run to the races in Florida the week of January 22 are coming in rapidly, and it is expected that the accommodations will all be taken before the middle of January. Fifteen have come in from the Chicago A. C., and requests

for information are being received daily. On the return trip a few hours will be spent in Chattanooga to visit Lookout Mountain, Missionary Ridge, and other places of historic interest. Those who wish to see the Chicago show may do so on a special ticket extension good for thirty days.

WASHINGTON TRADE THRIVES.

Dealers Planning to Meet Demand for Big Cars and Early Deliveries.

WASHINGTON, D. C., Dec. 30.—Material prosperity and extension in all directions characterized the automobile trade of this city during the year just closed. It was the greatest year the local trade has ever had and there is not a single dealer who is not eminently pleased with what the year brought forth.

Firms like the Cook & Stoddard Company, with the Locomobile, White, Franklin, Cadillac and Baker; the Pope branch with the full Pope line; Charles E. Miller & Brother, with the Ford; the Washington Electric Vehicle Transportation Company, with the Columbia line; the Wayne Automobile Company, and the National Automobile Company, with the Packard, Buick, Oldsmobile and Studebaker, did the cream of the business, but other agents got their share also.

The year was remarkable for the demand for higher-powered cars, and in many cases the cars could not be obtained to fill orders owing to the inability of the manufacturers to supply them. The dealers are now planning to insure early deliveries and an adequate supply of big cars.

The selling season is expected to open much earlier in 1906, owing to the fact that the local automobile show will be held nearly two months earlier than in any previous year. The armory of the Washington Light Infantry has again been secured for the show. The date selected, February 3 to 10, is satisfactory to all concerned.

GOBRON BRILLIE AGENCY.

E. V. Hartford, president of the Hartford Suspension Company, who has been in attendance at the Paris Show, has secured the American agency for the Gobron-Brillie car, which is one of the fastest cars of Europe. A. G. Hoffman, treasurer of the company, says the French car will be sold from the new factory and garage that is being built at Eighty-eighth street and Broadway, New York. The building will be 100 by 50 feet, two stories and basement, and will contain the factory for Hartford suspensions, the office and salesroom and all garage conveniences.

L. C. Burnett has been made sales manager of the company, while Carl Stevens will travel throughout the country establishing agencies. Hartford suspensions will be shown at both shows in New York. The Pope Manufacturing Company's branch has secured the agency for the suspension in Washington.

PROSPERITY IN INDIANAPOLIS

Manufacturers to Build 2,000 Cars Aggregating \$4,105,000 in Value.

INDIANAPOLIS, Dec. 30.—Figures obtained from the five automobile factories in this city show that local concerns expect to manufacture more than 2,000 automobiles during the year 1906. These figures, although large, are conservative and are based upon the extraordinary business during the year just closed.

Local manufacturers estimate that 30,000 cars will be manufactured in the United States in 1906 and say that of this number 8 per cent. will be made in Indianapolis. Accordingly they have dubbed Indianapolis "The Auto City."

All of the Indianapolis factories have many orders booked ahead and have unusually large forces of workmen at work. Despite this fact, it is probable that most of the factories will be behind in their orders before many weeks. The Premier Motor Car Company has just completed a large addition to its plant and other companies expect to enlarge their establishments before the new year has closed.

The Premier people are figuring on manufacturing 600 cars next year in five models, not including a truck, estimated at a total value of \$1,000,000. Other local concerns estimate their 1906 output as follows:

Pope-Waverley Factory, 600 cars, fifteen models, \$900,000; Nordyke & Marmon, 200 cars, two models, \$540,000; National Motor Vehicle Company, 350 cars, \$1,000,000; Marion Motor Car Company, 300 cars, \$665,000.

The new year will find practically every automobile dealer in this city handling a different line of cars from that he has handled in preceding years. With one or two exceptions the agency for every car in Indianapolis has been changed for the year 1906, and several makers find themselves now represented in the city for the first time.

The past year has been the most prosperous in the history of local dealers, and the coming year is looked forward to as another record-breaker. Many garages have been greatly improved and enlarged in anticipation of extraordinary business. The Gibson-Short Cycle and Auto Company is preparing to build a large addition, and it has already occupied another showroom that doubles its space. The Fisher Automobile Company is erecting a third story to its garage, and the Indiana Automobile Company has made extensive improvements that give it more space for display purposes.

Agencies for 1906, as placed to date, are as follows: Fisher Automobile Company, Premier, Maxwell, National and Stoddard-Dayton; Gibson-Short Cycle and Auto Company, Reo and Marmon; H. T. Hearsey Vehicle Company, Rambler, White and Pope-Waverley; Indiana Automobile Company, Winton, Olds-

mobile, Auto-Car, Cadillac and Ford; Columbia Electric Company, Leader; Federal Automobile Company, Stevens-Duryea; Lemon Automobile Company, no agency placed; Sears Brothers, no agency placed.

DEVELOPMENT IN SOUTH BEND.

SOUTH BEND, IND., Dec. 26.—The manufacturers of the Studebaker automobiles have just moved into a substantial new factory building that will add 250,000 square feet to the big plant that now occupies 110 acres of ground here, fifty acres of which are under roof.

One of the Studebaker representatives has just returned from Italy and France, where the Studebaker Automobile Company has good business prospects for the coming year. It is claimed that the Studebaker car recently made a tour through those countries without having incurred a penny's worth of repairs.

One of the engineers of the company has made a trip through Europe in search of new devices, and recently returned to the factory.

The Studebaker company will have a fine exhibit at the coming Chicago auto show.

In this famous vehicle town automobilizing is undergoing a great development. The roads have remained good until Christmas and none of the big and costly cars have yet gone into the garage for the winter.

RECENT INCORPORATIONS.

Ansonia Automobile Co., New York; capital, \$5,000. Directors: E. G. Potter, G. R. Kelso, F. W. White.

Chadwick Motor Car Co., New York; capital, \$50,000. Directors: A. W. Pross, C. E. Reed, George Muirer.

Imperial Electric Motor Co., Toronto, Canada; to manufacture power machinery, automobiles, etc.; capital, \$200,000.

Huntington Automobile Co., Huntington, N. Y.; capital, \$5,000. Directors: A. Heckscher, F. H. Berthold, G. C. Fraser.

Carlson Automobile Co., Brooklyn, N. Y.; capital, \$15,000. Directors: C. A. Carlson, Chalmers Dale, Jr., C. W. McKelvey.

Gearless Motor Cycle Co., Rochester, N. Y.; capital, \$50,000. Directors: A. L. Sweetland, R. Burns and M. A. Harrison.

The Treacy Automobilium, Ltd., New Orleans, La.; capital, \$50,000. Directors, W. J. Tracy, W. P. Tracy and William Bradley.

American Motor Car Co., Indianapolis, Ind.; capital, \$25,000. Incorporators: W. A. Moore, W. E. Barton and C. R. Cameron.

Austin Automobile Co., Newark, N. J.; capital, \$25,000. Incorporators: Herbert Austin, T. G. French, Jr., and Charles Krebs.

Weed Chain Tire Grip Co., New York; to manufacture vehicles; capital, \$100,000. Directors: H. D. Weed, H. P. Denison, H. E. Chase.

Westchester Motor Car Co., New Rochelle, N. Y.; capital, \$25,000. Directors: K. S. W. Glasser, J. A. Mahtstedt, F. W. Bender.

Bransstetter Motor Co., Chicago, Ill.; capital, \$2,500; operate garages. Incorporators: H. P. Bransstetter, H. H. Look, O. M. Schultz.

Automotor Transfer & Storage Co., Orange, N. J.; capital, \$45,000. Incorporators: J. A. Ball, L. A. McNulty and A. P. Bachman.

Hicks Speed Indicator Co., Brooklyn, N. Y. (manufacture speed indicators); capital, \$3,000. Directors: E. P. Hicks, C. R. Johnson, Carl Knoff.

Atwood Automobile Co., Toledo, O.; capital, \$40,000. Incorporators: H. M. Smith, D. D. Flanner, R. H. Baker, D. V. R. Manley and Frank Mulholland.

American Continental Caoutchouc Company, Chicago, Ill.; capital, \$10,000; to deal in tires. Incorporators: Harrison Musgrave, J. B. Gascogne and J. H. S. Lee.

Broderwisch & Glancy Automobile Co., Dayton, O.; capital, \$25,000. Incorporators: Edward Borderwisch, E. M. Glancy, O. C. Waveries, L. Y. Cooper and W. G. Powell.

Twombly Motor Car Co., New York, to manufacture engines; capital, \$1,000,000. Incorporators: Charles C. Dodge, T. Wayne Murray, A. V. Remsen and Edward C. Billings.

The Covell & Crosby Motor Co., Bay Shore, N. Y.; manufacture and deal in automobiles, etc.; capital, \$20,000. Incorporators: E. L. Tamblin, J. I. Bergen, W. P. Barker.

Watertown Automobile & Supply Co., Watertown, N. Y.; manufacture and deal in automobiles and automobile supplies; capital, \$5,000. Incorporators: L. G. De Cant, P. A. Pitcher and J. A. McConnell.

Chesapeake Launch & Motor Co., Norfolk, Va.; capital stock: maximum, \$15,000, minimum, \$5,000. Incorporators: F. W. McCulloch, president; J. S. Taylor, vice-president; F. W. Culpepper, secretary and treasurer.

A novelty of the Paris Salon is a motor road-skate, which, fitted to the feet, is said to take the "rider" at a speed of twenty-five miles an hour. Beneath the plate for the foot, instead of a runner or boxwood rollers, are four small wire, rubber-tired wheels, carrying between them a tiny air-cooled, single-cylinder engine at an acute angle to the ground. At the rear is a little gasoline tank. The engine is direct connected to the rear axle, while the front wheels are mounted on a bogey. Ignition is by battery and coil. The price asked is \$120 a pair.

Sometimes the engine can be started on a cold morning by partly stopping up the main air inlet, so as to produce practically the same effect as flooding the carbureter.

News and Trade Miscellany.

The Elmore Manufacturing Company, of Clyde, O., makes the announcement that it has acquired a basic patent covering the essential features of the two-cycle gasoline motor, and that other manufacturers of two-cycle engines must negotiate with the Elmore Company if they desire to continue the manufacture of this type of motor. The patent in question was owned by Joseph Day, of Rumford, England, who convinced the Elmore Company of the validity of his claims and sold to the company the American rights. The patent has only a year to run before expiration.

The 4-horsepower car built by Henry Ford in 1891, on which the contest against the Selden patent suit hinges, is on view at the New York branch of the Ford Motor Company, at 1723 Broadway, side by side with the latest Ford model, a six-cylinder car. Much attention is attracted by the intrinsic interest of the cars and by the contrast between the old and the new.

A suit brought against the Grout Brothers Automobile Company, of Orange, Mass., by Miss Helen Walker, of St. Louis, Mo., for the purchase price of an automobile said by the plaintiff to have been inferior to the representations of the manufacturers, has been won by the defendants. Miss Walker bought a Grout steam car at the St. Louis Exposition, and later exchanged it for another of the same make on the ground that the first car was defective. The suit was brought on the allegation that the second was defective also, but the jury found for the defendant.

Under the name of The Mechanical Advisory Board, a company composed of expert mechanics and engineers has been formed in Chillicothe, O., and incorporated under the laws of the state, for the purpose of investigating and giving expert opinion on the merits of inventions with a view to saving inventors the expense of taking out patents for worthless devices, and, on the other hand, to encourage the development of practical inventions. The originator of the plan was B. A. Gramm, of the Logan Construction, of Chillicothe, who, is one of the incorporators and president of the company. His associates are B. W. Twyman, vice-president; Fred Bizant, secretary and treasurer; Charles Elliott, chief engineer, and C. K. Probst, chief draftsman. A fee will, of course, be charged for passing upon an idea.

A tire competition on novel lines has been planned by the Pennsylvania Rubber Co., of Jeannette, Pa., \$1,000 in cash being offered for prizes. All users of Pennsylvania tires are eligible as competitors, and the winner will be the automobilist who finishes the season of 1906 with the least tire expense per mile run; a minimum distance of 2,500 miles is set. Prizes will vary from \$500 for first prize to \$10 for ninth prize. A book on the care and handling of tires will be given to each competitor.

First Vice-President Albert Pope and Second Vice-President C. E. Walker, of the Pope Mfg. Co., of Hartford, Conn., were in Philadelphia last week, as was also Henry Goodman, of the Pope-Waverley factory, of Indianapolis, Ind.

The Fiat is the latest car to secure representation on Philadelphia's "automobile row." H. Allen Dalley, local agent, established headquarters last week at 215 North Broad street.

A. H. Chadbourne, of the Cape May Automobile Club, contemplates running a series of "matinee" auto races at that resort next Summer at fortnightly intervals.

R. E. Olds, president of the Reo Motor Car Company, has completed arrangements with the Seaboard Air Line for transportation to the Florida races for himself and a considerable party. Officials of the Maxwell-Briscoe Motor Car Company, including Benjamin Briscoe, J. D. Maxwell, C. W. Kelsey, H. E. Randolph, A. S. LeVino, and others, are also negotiating with the Seaboard for extensive accommodations. A. L. Kull and party, of the Wayne Company, have leased the private car *Sunbeam*, to be hauled on the Saturday midnight train known as the "Ormond two-miles-a-minute Special."

Frank Rantz and family, of Bridgeport, and Judge Archer and family, of Greenwich, Conn., who are making a pleasure trip from Bridgeport to Los Angeles, arrived in Buffalo recently. There are seven people in the party and they are using a Maxwell runabout and a Maxwell touring car. They reported a fine run between Bridgeport and Buffalo, no accidents of any sort and no repairs necessary. They resumed their journey after a day's rest. Neither of the cars required any attention beyond a cleaning of mud from the wheels.

Sales Manager Howell, who is in charge of the Decauville Company's Franklin business, is much elated by the appearance in New York of the first six-cylinder Franklin touring car received in that city. W. F. Winchester, who drove in the elimination race for the Vanderbilt Cup, drove the car from Philadelphia and has been showing it and giving demonstrations of its power. The car is known as Type H, is of 30 horsepower and has a 114-inch wheelbase.

Until last Spring there was not a garage or an auto repair shop in Portsmouth, N. H. Now there are four, and a fifth is assured, that, with the opening of the season, shall surpass all the others in facilities for repairing and supplying automobiles.

Carl H. Page, manager of the New York branch of the White agency, and Mrs. Charles H. Page, his mother, returned to their home in Worcester, Mass., on Sunday, Dec. 24, after a six weeks' tour of Italy, Switzerland, and France. Mrs. Page is a native of Berne, Switzerland, and her recent visit there is the first since she came to America, nearly forty years ago. Mr. Page represented the White Company at the Paris show. After spending Christmas with his parents, he hurried to New York to perfect arrangements of his company for the coming show at Madison Square Garden.

Manager W. B. Hurlbut, of the Packard Motor Car Company, of New York, will go to Ormond, and while there will probably drive one of the new fast 1906 runabouts now being made by the Packard company.

Two thousand miles have been traveled by the Thomas Flyer used for demonstrating in New York. Included in the mileage is a round trip journey to Wilkesbarre and a climb up the Wilkesbarre Mountain road in record time.

Negotiations are in progress at Washington, D. C., for a garage for the Washington branch of the Pope Motor Car Co. A portion of the Pope building on Fourteenth street has heretofore been used for garage purposes, but it has been found necessary to utilize this space for displaying cars, hence the imperative need of a separate garage. A. L. Pope and Charles Walker were in Washington last week and secured an option on a three-story building on Sixteenth street.

J. C. Pettepher, proprietor of the Florida East Coast Garage, Daytona, Fla., after experimenting for two years with a metal composition with which to mend sand-holes, cracked cylinders, or in fact any crevice or flaw in cast-iron and other metals, is now preparing to market the composition, which he has been using for some time in his repair work, and which he states is soft and pliable while being used, but quickly hardens without contraction.

Two recent sales of Smith & Mabley 1906 Simplex cars were made through Con Baker, Philadelphia agent for the company, to John W. Woodside and Robert M. Janney, both of Philadelphia. A third sale negotiated through their Philadelphia agent was that of a Panhard to Harry W. Harrison.

What was formerly the Wheeler Manufacturing Company, of Detroit, Mich., has become the Rand Manufacturing Company, the corporation name of the concern having been changed. The company makes the "Rand" canopy, cape and extension tops.

The White Sewing Machine Company has established an agency in Brick Church, N. J., with B. F. Adams. The New Haven representative for the company is W. P. Frost, of 666 State street. J. M. Dickson, Federal street and Fifth avenue, Troy, N. Y., will look after the company's interests in this city.

Mr. Foster, manager of the Chicago agency for the Cadillac, who also controls the district of Illinois for the company, intends to establish a number of new agencies in various parts of Illinois for the sale of next year's cars. There are at present about twenty-six of these branch stores throughout the state, but Mr. Foster hopes to double this number.

Manager W. F. Smith, of the Rambler branch in Philadelphia, has given hurry orders to the renovators to put the Broad street salesrooms and the uptown storage and repair plant in shape for the 1906 campaign. Both buildings are being rearranged to facilitate the expected enlarged business of the coming season. Similar repairs are in progress at the garage of the Quaker City Automobile Company.

The first consignment of English Daimler cars has been received by the English Daimler Company and placed on exhibition at the new salesrooms of the Decauville Automobile Company, New York agents for this car. The first shipment consists of four cars, two of 28-36 horsepower and two 30-40 horsepower, one of the latter a chassis.

The New York premises of the Continental Caoutchouc Company, at 43 Warren street, consist of a double-front store extending back 75 feet, under which are two basements. The ground floor is used exclusively for offices, while stock is kept and repair work done in the basements. The repair work is in charge of experts sent from the factory at Hanover, Germany. The repair department is divided into two rooms, one for building up and the preparatory work, and the other for vulcanizing. The work is done in the same way as at the factory in Germany.

Allan H. Whiting has been appointed sales manager of the Autocar Company, Ardmore, Pa., to fill the vacancy occasioned by the resignation of Marcus I. Brock. Mr. Whiting was formerly sales manager of the Edison Storage Battery Company, Orange, N. J.

Charles E. Miller, the well-known jobber, has opened a branch house at 824 Main street, Buffalo, and another in Detroit at 227-9 Jefferson avenue.

The Automobile Trade Credit Association was formed in New York at a recent meeting of representatives of dealers in automobiles and accessories and supplies, about sixty concerns being represented either by delegates or by letter. A permanent organization was effected and incorporation papers prepared; by-laws were adopted, and a board of seven directors elected. F. J. Alvin, manager of the American Electrical Novelty and Manufacturing Company, was elected president of the association, and Franz Neilson, of 80 Wall street, New York, secretary and counsel. The objects of the association are the protection of members from unscrupulous purchasers who abuse their credit; the detection of frauds; the dissemination of information as to the standing of buyers; the collection of old accounts; the settlement of differences between members, or between members and their customers, and so on.

An expression of appreciation for the courtesies received during the past year from the press, the Panhard & Levassor American branch entertained the New York automobile writers at the Café Martin on Saturday evening, December 30. Andre Massenat, president of the American branch, presided over the feast, while A. de Magnin, assistant manager, was his able assistant; Thomas J. Moore was toastmaster. Messrs. Massenat and de Magnin welcomed the guests in the name of the parent company. The evening was made particularly enjoyable by the happy manner in which the toastmaster introduced the speakers of the evening, and the equally apt responses made by the guests.

One of the first of a number of delivery vehicles has just been completed by the Premier Motor Car Company for John Wanamaker, of Philadelphia. The car is pronounced by its owner to be the handsomest now owned by him. It has a capacity of 1,500 pounds and is designed for small-package delivery.

The Branstetter Auto Company, of Chicago, has changed its name and will hereafter be known as the Mitchell Company.

✓ The Frayer-Miller Automobile Co., of New York, will be located hereafter at the corner of Sixty-fifth street and Broadway. Their present quarters have been re-leased to C. B. Rice, of the Baker agency. Manager Knepper received last Wednesday the first of the four-cylinder 1906 Frayer-Miller cars and is now arranging demonstrations.

The Rainier Company's Chicago branch will be located at 1255 Michigan avenue, the quarters formerly occupied by the A. C. Banker Company. The Chicago branch will be in charge of E. L. Cordner, who was for many years right-hand man for Klaw & Erlanger.

✓ The H. H. Franklin Manufacturing Company, of Syracuse, N. Y., states that Franklin cars are being ordered for shipment to Mexico, Yucatan, Porto Rico and Canada. A. H. Frazer, secretary to Governor Winthrop, of Porto Rico, is a recent purchaser of a Franklin. Mr. Frazer has owned two Franklins of earlier models. The company reports a very brisk business.

A. J. Pickard, lately with the American Darracq Auto Company, has become associated with the Rainier Company, of New York City.

The National Automobile Co., of Washington, D. C., is planning to open a downtown salesroom where the Packard, Buick, Oldsmobile and Studebaker cars can be shown to better advantage than at the garage on Fourteenth street. The company will take on another large car some time in January.

The Florio Cup race, which is the great Italian automobile event, held for the first time in 1905, was won by an Italian car, fitted, according to the Hess-Bright Mfg. Co., of 245 North Broad street, Philadelphia, with D. W. F. ball bearings, of the type manufactured by the Hess-Bright Co.

The Dayton Electrical Mfg. Co., of Dayton, O., announces that the lead bottle Apple storage battery has met with such success that facilities for manufacturing it have been doubled. This concern has brought out a new storage battery charger which keeps the battery charged while the car on which it is used is running.

✓ The Gray Motor Company, of Detroit, Mich., has incorporated with a capital stock of \$12,000. Four thousand dollars has been paid in, half in cash and half in models and designs used in the manufacture of Gray power boats and engines.

The Pontiac Motor Company, a new automobile concern organized in Pontiac, Mich., has elected the following officers: President, Dr. V. H. Wells; vice-president, George E. Fisher, of Detroit; secretary, Albert Burton; treasurer, F. L. Perry. The company will build commercial vehicles and a combination commercial and pleasure vehicle.

Howarth & Rogers Co., of Amesbury, Mass., whose factory was destroyed by fire recently, have purchased a new three-story brick building, which has been equipped with machinery, and which will be devoted to the manufacture of automobile bodies exclusively.

The new garage of the Cook & Stoddard Co., of Washington, D. C., located in the old riding academy at Twenty-second and P streets, has been opened for business. The company has announced its 1906 line as follows: Locomobile, White, Franklin, Cadillac, Baker electric.

Improvements that give it much additional space are being completed by the Indiana Automobile Company in Indianapolis. This concern recently changed hands and the new management expects to do an increased amount of business during the coming year.

The agency for northern New Jersey for Rainier cars has been placed by the Rainier Company of New York with the New Jersey Motor Car Company, of East Orange, N. J. Sub-agency for the Rainier has also been established in Brooklyn with the Prospect Park South Garage.

The Baker-Cormier Motor Car Co., Inc., has opened a salesroom in Boston, at 141 Massachusetts avenue; this company has acquired the eastern agency for the Premier cars.

The Auto Cape Top Company, Chicago, has removed from 541 Wabash avenue to 1466 Michigan avenue.

Two recent agencies closed by the Northern Manufacturing Company are as follows: Auburn, N. Y., Auburn Auto Co.; Toledo, O., Atwood Auto Co. The latter company, recently incorporated, is erecting a garage on Monroe street.

In describing the Geecce dry storage battery, manufactured by the Royal Battery Co., of 143 Chambers street, New York, in THE AUTOMOBILE of December 28, the electrolyte used was erroneously referred to as gelatinous; the electrolyte is *non-gelatinous*, and the manufacturers strongly emphasize this point as being of great importance in the success of the battery. The substance used in place of a liquid or of a gelatinous electrolyte is white and spongy, and is said to be capable of retaining moisture indefinitely.

The Brampton chain, imported exclusively by Charles E. Miller, of 101 Reade street, New York, is made in sizes to fit standard American cars. The Brampton chain is extremely strong; it has a connecting link fitted with a bolt and nut instead of the ordinary pin and cotter. Each link is grooved to retain oil, and a single oiling will last a long time.

The Knox Motor Truck Co., Springfield, Mass., announce the sale of four of their three-ton Atlas trucks to the following concerns: Two trucks to the Springfield Provision Co.; one each to Meekins, Packard & Wheat, and T. Shea, all of Springfield.

R. L. Kingston, of 141 West Thirty-eighth street, New York, has secured the agency in this country for the Hamburg tire, made in Germany.

E. R. Thomas, of the E. R. Thomas Motor Company, spent Thursday in New York, going over the plans of the new garage now being constructed for Harry S. Houpt as New York headquarters for the Thomas Flyer.

Manager A. L. Kull, of the Wayne Company of New York, and Jesse Draper, sales manager of the Wayne Company, of Detroit, spent Thursday in Philadelphia, closing the agency for that city.

President A. J. Cassatt, of the Pennsylvania Railroad Company, has just ordered a one-design power boat from the E. H. Godshalk Company, builders of the unbeaten *Nada*.

The Amesbury Brass & Foundry Co., Amesbury, Mass., is now manufacturing castings of aluminum bronze and brass for the automobile trade.

There is a new addition to the numerous garages in Indianapolis, the newcomer being the Federal Automobile Company. The manager is W. A. Carr, who is well known among Indianapolis drivers.

The Northern Motor Car Company, lately incorporated with \$15,000 capital stock, will manufacture automobiles in Chicago.

P. C. Rutan, 46 Front street, Port Jervis, N. Y., has secured the local agency for the Wayne cars for 1906.

Among recent sales of 1906 Thomas cars, made through the office of C. S. Henshaw, New England representative of the Thomas Flyer, were to W. H. Wesson, Springfield, Mass.; Danny Maher, Hartford, Conn.; Charles P. Williams, Stonington, Conn.; C. W. Briggs, Norwich, Conn.; F. C. Hood, of the Hood Rubber Co., Boston, Mass.; F. L. Willard, of the Riverside Boiler Works, Boston, Mass.; George H. Gibby, East Boston, and J. H. Cross, Boston.

The organization of the Traverse City Motor Boat Company, of Traverse City, Mich., is now completed and the company will be ready for business as soon as the factory is completed.

R. H. Beacham & Son, well-known livery stable keepers, of Portsmouth, N. H., are agents for the Oldsmobile cars.

W. F. and C. E. Woods, noted basketball players, have taken the agency for Cadillac cars in Portsmouth, N. H.

For the automobilist who is anxious to cover up his lack of skill and experience or the imperfections of his machine, the New York *Globe* has published an "Excuse Book for Automobilists," in which fifty facetious excuses for mishaps of various kinds are given for ready reference. Al. Reeves, the author of the "work," has apparently had an almost inexhaustible source of information to draw from, for he states that there are lots more excuses not printed in the book. The "Book of Excuses" is sent free to anyone who wants one. Apply to the Automobile Department of the *Globe*, New York.

INDEX TO ADVERTISERS

A	
Acetylene Gas Illuminating Co.	37
Aerocar Co.	76
Albright Mfg. Co.	49
Am. Anti-Puncture Tire & Auto Co.	40
American Ball Bearing Co.	42
American Coll. Co.	36
American Generator Co.	44
American Machine Mfg. Co.	38
American Veneer Co.	41
Anderson & Sons Co.	39
Auburn Automobile Co.	70
Auto Brass & Aluminum Co.	39
Auto Pump Co.	35
Auto Rebuilding Co.	54
Automobile Equipment Co.	67
Automobile Supply Co.	37

B	
Badger Brass Mfg. Co.	56
Baker Motor Vehicle Co.	96
Baldwin Chain Mfg. Co.	39
Bartholomew Co.	33
Beebe, A. M.	43
Bemis, T. Alton	46
Beverly Mfg. Co.	39
Blomstrom Motor Car Co., C. H.	37
Boker & Co., H.	51
Boston Auto Gauge Co.	38
Boston Automobile Exchange.	37
Boston Cycle & Sundry Co.	38
Bowser & Co., S. F.	53
Brennan Motor Co.	40
Briscoe Mfg. Co.	49
Brown Mfg. Co., J. C.	55
Brostell Hotel.	83
Buckeye Mfg. Co.	68
Buckeye Wheel Co.	40
Burgin Bros.	35
Burlington Railway.	58
Byrne-Kingston Co.	58

C	
Cadillac Motor Car Co.	36
Capitol Foundry Co.	39
Carbondale Chemical Co.	36
Carlyle Johnson Machine Co.	Cover
Carr, F. S.	51
Central Body Co.	43
Chalfonte Hotel.	54
Champion Co., Albert.	37
Champion Mfg. Co.	38
Chandlee & Chandlee.	68
Chelsea Clock Co.	36
Chicago Automobile Show.	69
Chicago & Northwestern Ry.	43
Cleveland Canton Spring Co.	45
Collins & Sons, G. A.	45
Columbus Buggy Co.	75
Connecticut Tel. & Electric Co.	60
Continental Caoutchouc Co.	64
Continental Motor Mfg. Co.	52
Corbin Motor Vehicle Corporation.	95
Corcoran Bros. Co.	57
Corwin Mfg. Co.	Cover
Covert Mfg. Co.	39
Crawford Automobile Co.	83
Crucible Steel Casting Co.	39
Cullman Wheel Co.	39

D	
Daimler Mfg. Co.	37
Davis Mfg. Co.	53
Dayton Electric Mfg. Co.	61
Dayton Motor Car Co.	91
Diamond Chain & Mfg. Co.	39
Diets, R. E.	56
Diesmann Shock Absorber.	59
Dixon Crucible Co. Joseph.	40
Dodge Lubricator Co.	59
Dorris Motor Car Co.	79
Dow Portable Electric Co.	37
Draper Bros. Co.	36
Duff Mfg. Co.	51
Duquesne Construction Co.	70

E	
E. H. V. Co., The.	87
Eclipse Buggy Co.	43
Edmunds & Jones Mfg. Co.	40
Elbridge Electrical Mfg. Co.	46
Eldredge Electric Mfg. Co.	36
Electric Vehicle Co.	98
Elmore Mfg. Co.	89
Excelsior Supply Co.	36

F	
Fairmount Engineering Works.	36
Ford Motor Co.	78
Ford & Dennen.	36
Franklin Mfg. Co., H. H.	105
Franklin Portable Crane & Hoist Co.	49
Frost, F. E.	40

G	
G & J Tire Co.	65 and Cover
Gabriel Horn Mfg. Co.	50
Garage Equipment Co.	40
Garford Co., The.	47
Garlick Auto Prop Co.	42
Gibbs-Brower Co.	45

Gilbert Mfg. Co.	33
Goodrich Co., B. F.	Cover
Goodyear Tire & Rubber Co.	41
Grand Hotel, The New.	54

H	
Ham Mfg. Co.	57
Hardy Co., The R. E.	37
Harris Oil Co., A. W.	Cover
Harrison Wagon Co.	74
Hartford Machine Screw Works.	37
Hartford Rubber Works.	61
Hartford Suspension Co.	73
Hatcher Auto-Parts Co.	49
Havemeyer Oil Co.	36
Haynes Automobile Co.	89
Heinze Electric Co.	52
Herz & Co.	49
Hoffman, Geo. W.	37
Holley Bros. Co.	Cover
Hopson & Chapin Mfg. Co., The.	39
Hyatt Roller Bearing Axle Co.	48
Hydraulic Oil Storage Distributing Co.	45

I	
Illinois Central Railway.	68
Imperial Brass Mfg. Co.	40
Iroquois Motor Car Co.	70

J	
Jackson Automobile Co.	74
Janney, Steinmetz & Co.	36
Jeffery & Co., Thomas B.	85
Jersey Brake Co.	49
Jones & Burt.	68

K	
Kansas City Motor Car Co.	77
Kells Mfg. Co., W. J.	39
Kent Mfg. Works, Atwater.	36
Kirkham Motor Mfg. Co.	41
Knox Automobile Co.	90

L	
Leather Tire Goods Co.	66
Lee Mfg. Co.	48
Light Mfg. & Foundry Co.	42
Lipman, C. E.	36
Lobe Pump Co.	36
Locke & Co.	47
Locomobile Co. of America, The.	100
Logan Construction Co.	85
London Auto Supply Co.	43
Loring, E. J.	55
Lozier Motor Co.	111

M	
Madison-Kipp Lubricator Co.	38
Manning Mfg. Co.	37
Manufacturers' Motor Car Co.	43
Mathewson Motor Car Co.	88
Maxwell-Briscoe Motor Co.	106-107-108-109
McCord Mfg. Co.	39
McDonald, Wessels & Ames Co.	39
Merkel Motor Co.	40
Merritt Co.	44
Miami Pattern Works.	37
Michelin Tire	68
Middleton Auto Body Co.	43
Miller, Charles E.	52
Milwaukee Steel Foundry Co.	39
Moline Automobile Co.	82
More Power Co.	36
Morgan, B.	46
Morgan & Wright.	62
Mossler & Co., A. R.	38
Moss Photo Engraving Co.	38
Motor Car Equipment Co.	62
Motor Car Supply Co.	39
Motor Specialty Co.	37
Mutty, L. J.	48
Myers-Dayton Top Co.	43

N	
National Automobile Show.	81
National Battery Co.	47
National Carbon Co.	43
National India Rubber Co.	41
National Motor Vehicle Co.	91
National Sales Corporation.	48
Navarre Hotel.	55
New York and New Jersey Lubricant Co.	37
New York Gear Works.	42
New York School Auto Engineers.	42
Newmastic Tire Co.	44
Nicholsberg Mfg. Co., H.	41
Nordyke & Marmon Co.	84
Normandie Hotel.	46
Northern Mfg. Co.	93
Nuttall Co., R. D.	39

O	
Oakes & Dow.	37
Ofeldt & Sons.	36
Olds Motor Works.	92

P	
Pacific Tucking & Mfg. Co.	41
Packard Electric Co.	37
Packard Motor Car Co.	104
Parish & Bingham Co.	39
Pedersen, J. T.	40
Peerless Motor Car Co.	88
Pennsylvania Rubber Co.	64
Pioneer Brass Works.	39
Pneumatic Tire Protector Co.	62
Pope Motor Car Co.	90
Post & Lester Co.	38
Powell Mfg. Co.	67
Prest-O-Lite Co.	38

R	
Rapid Motor Vehicle Co.	67
Reo Motor Car Co.	103
Railway Appliances Co.	45
Rainier Co., The.	102
Rajah Auto Supply Co.	42
Remy Electric Co.	48
Republic Rubber Tire & Shoe Co.	37
Riverside Body Factory.	43
Robert Instrument Co.	36
Royal Battery Co.	45
Royal Equipment Co.	36
Royal Motor Car Co.	82
Rushmore Dynamo Works.	56, 57

S	
Saks & Co.	33
Sampson-Leather Tire Co.	62
Seaboard Air Line.	47
Seldier-Miner Electric Co.	37
Shaw, Ora D.	37
Shawyer Co.	37
Sheddan Mfg. Co.	55
Sixth Annual Automobile Show.	81
Smith Auto Co.	82
Smith & Mabley.	110
Snow, N. H.	43
Speed Changing Pulley Co.	51
Spicer Universal Joint Mfg. Co.	41
Spiltdorf, C. F.	37
Sprague Umbrella Co.	60
Springfield Metal Body Co.	43
Springfield Moulding Works.	40
St. Louis Car Co.	41
Standard Foundry Co.	39
Stearns, F. B.	101
Steel Ball Co.	36
Stevens Arms & Tool Co.	98
Stolp Mfg. Co.	49
Stone & Downer Co.	38
Streit Machine Co., A.	52
Swinehart Clincher Tire & Rubber Co.	62
Syracuse Aluminum & Bronze Co.	39

T	
Thomas Motor Co., E. R.	94
Timken Roller Bearing Axle Co.	58
Trebert Auto & Marine Motor Co.	52
Trebert Gas Engine Co.	52
Tritt Electric Co.	37
Tucker, C. F.	36
Tuthill Spring Co.	48

U	
Ultra Pump & Power Co.	50
Uncas Specialty Co.	49
Unedme Tool Co.	67
Upton Motor Co.	37

V	
Veeder Mfg. Co.	40
Vehicle Specialty Co.	44
Voight, Em.	99

W	
Wabash Railroad.	54
Walker Co., E. C.	36
Walham Mfg. Co.	80
Walworth Mfg. Co.	35
Warner Instrument Co.	44
Way Muffler Co.	72
Wayne Automobile Co.	38
Welch Motor Car Co.	68
Western Oil Pump Co.	38
Western Tool Works.	70
Weston Electrical Instrument Co.	40
Wheeler & Shebler.	71
White Sewing Machine Co.	84
Whitlock Coil Pipe Co., The.	42
Whitney Mfg. Co.	48
Williams, E. Q.	37
Wilson Auto Clock Co.	36
Winkley Co., The.	46
Winton Motor Carriage Co.	112
Witherbee Igniter Co.	47
Wolverine Auto and Com. Vehicle Co.	82
Wray Pump & Register Co.	50

Y	
York Hotel.	54

SPECIAL NOTICES

Advertisements inserted under this heading at 20 cents per line; about 7 words make a line. Remittance should accompany copy. Replies forwarded if postage is furnished.

BARGAINS—50-h.p. Panhard 1906, being painted, 28-32 Mercedes, with two bodies newly painted. A rare chance for any one interested. Parsons, care Decauville Auto Co., 1684 Broadway, New York. Jan 4

DESIGNERS wanted, experienced on gaso-line engines, transmissions and truck construction; none but those having had experience along this line need apply, giving references, details of experience and salary wanted. Address "American," care The Automobile. Jan 4

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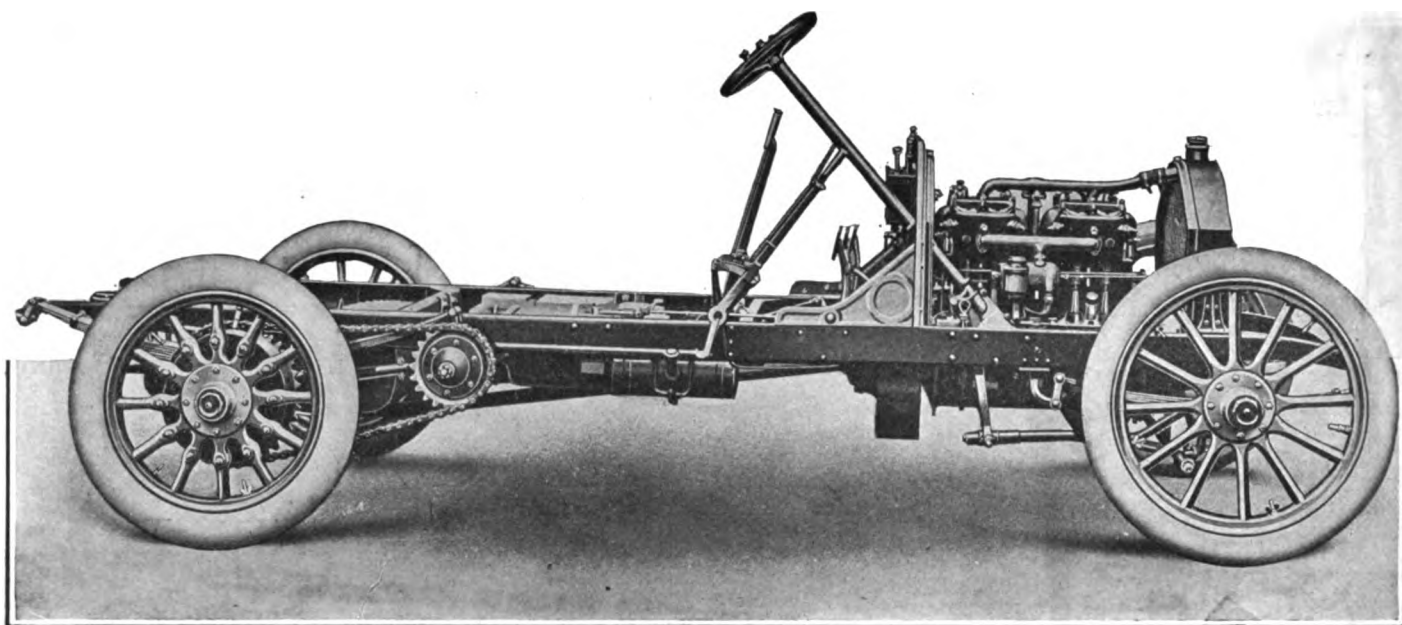
GREAT ENGINEERING CONCERNS EXHIBIT.

THE seriousness of the automobile industry could be no better exemplified than by a careful consideration of the maiden appearance at the New York shows of certain exhibitors of complete cars. While the mere matter of the total number of concerns represented by exhibits at the Garden and Armory is in itself an irrefutable proof of the growth and prosperity of the business of building automobiles, and the allied trades, this of itself does not more truly promise stability than does the appearance in the industry of a number of manufacturing establishments of the first magnitude.

Although a few great manufacturing concerns have been finding for the past few years an outlet for some small part



WHERE THE SHOWS WERE HELD—LOOKING WEST ON TWENTY-SIXTH STREET, ARMORY ON LEFT, MADISON SQUARE GARDEN IN BACKGROUND.



CHASSIS OF 30-H.P. WESTINGHOUSE-SCHMID CAR BUILT AT HAVRE, FRANCE—EXHIBITED FOR FIRST TIME IN AMERICA.

of their product in supplying materials for automobile construction, until this year the large engineering works of the country have not taken up the building of automobiles in other than along experimental lines.

There are now in the market several cars which will be manufactured by such concerns, either by subsidiary companies or under the direct supervision of the parent company. In one case the matter is for the time in abeyance, but the indications all point to an early decision favorable to the plan. In three other instances the work is well under way, and vehicles are being turned out with definite dates of delivery.

The entrance into the automobile industry of such a concern as the American Locomotive Company marks an epoch in the American history of the self-propelled vehicle, and supplemented by the E. W. Bliss Company and the company already organized by the president of the St. Louis Car Company, and possibly later the entry of the Westinghouse companies, indicates the importance of the automobile as a factor in the industrial future of the country. All of these concerns made their initial public display during the show week.

The American Locomotive Company, with ten enormous plants and inexhaustible mechanical resources at its command, is well fitted to carry out the scheme of producing work of the highest order. The plant, specially erected at Providence, R. I., for the use of the subsidiary company, the American Locomotive Automobile Company, will be supplemented by the comprehensive testing laboratory of the parent company at the Schenectady, N. Y., and such other plants as may be of material assistance in carrying out the manufacturing scheme now in hand.

The type of car to be manufactured is a reproduction in each detail of the Berliet

chassis made at Lyons, France. In this mechanism the prominent characteristics are materials of the very highest grade, special steels for various parts being used throughout the construction. The make-up follows accepted practice, but many refinements of details are observed on close inspection. The chassis now in hand are the product of the Lyons house and show a four-cylinder motor with valves on opposite sides, cylinders cast in pairs, make and break ignition from gear-driven magneto, four speeds and reverse operated on the selective system, with final drive through double side chains.

The company is now importing finished parts, and the chassis will be assembled at the Providence plant. As soon as possible the parts will be manufactured in the home manufactory, duplicate tools, jigs and gauges being an important part of the equipment of the new works. The chassis will be made in its entirety in this country and on the plan of interchangeability of each part with chassis of corresponding model of the French-built Berliet.

The E. W. Bliss Company, while one of the important engineering concerns in the country, has long been famous by reason of the character of the product turned out. All the torpedoes used by the United States Navy are made in the Brooklyn city factory of this company. As the torpedo is a mechanism calling for work of the very highest order it follows that the factory equipment and the personnel must be exceptional to produce these engines of war in a manner satisfactory to the Government.

Projectiles form no inconsiderable part of the output at the tidewater plant of the concern, in Brooklyn, also highly specialized machinery and gears of all kinds, the gear-cutting department being of enormous proportions.

In such a plant, with the experience of

years and an intimate knowledge of the special grades of steel which must be used in the manufacture of such articles as armor-piercing projectiles and torpedoes, it is a reasonable supposition that an effort directed towards automobile engineering will be eminently successful.

The car and chassis exhibited by Douglas Andrews, selling agent of the Bliss car in New York, is designed along accepted lines, and possesses no radical departure from typical construction.

The use of highest grades of nickel and chrome steel are general throughout the car, and the greatest care has been used in the proportioning of the gears and other parts. The transmission system provides a drive through but one pair of gears for first, second and third speeds, with fourth speed direct, two sets of bevel gears and pinions being fitted to the shafts in the transmission.

The engagement of speeds is progressive, the change speed lever moving over a notched quadrant from reverse at the rear to fourth speed forward. Final drive is by side chains. But one model has been decided on, a four-cylinder, 30-horsepower chassis priced at \$5,000. The complete car at the Armory was provided with a body by Demarest, and the finish in all details carried out with taste and judgment.

George J. Kobusch, president of the St. Louis Car Company, by reason of his intimate acquaintance with transportation problems, is eminently fitted to head the organization of a company formed for the purpose of reproducing the well-known Mors car. The St. Louis Car Company has been established for two decades as one of the largest manufactories in the country of coaches for steam railways and cars for suburban electric service. The company's product in New York City is well represented by about 230 cars, now in use in the Subways, and more than 700 cars in the

suburban service out of New York. A considerable department of the business has been the manufacture of pressed steel cars, the output being five complete cars a day throughout the year. No less than 3,200 men are employed in the great works, and the new buildings erected for the automobile branch will give employment to more than 400.

In the selection of a type the Mors was chosen and suitable arrangements made with the Société Anonyme Mors for the exact reproduction of the various models made by this famous French house. Each car will be an exact duplicate of the foreign machine of a corresponding model, the metric measurement system being employed, and not only shop drawings but duplicate parts will be furnished by the Mors company for the guidance of the St. Louis concern.

The car is so well known that a description is hardly necessary, though it may be said to contain typical features such as sliding-gear change speed with direct drive on fourth speed, controlled by a progressive lever. The drive on all speeds but fourth is through a pair of gears and a bevel gear and pinion on the secondary shaft, a second bevel set driving from the first shaft on the engagement of high speed.

Motors will be built with cylinders cast in pairs for the higher powers and with

individual cylinders for the two smaller engines. The Mors practice of offsetting the cylinders will be, of course, followed in the Kobusch car.

As an indication of the progress made in the new plant, it may be stated that some fifty odd chassis are in process of assembly, with over a hundred in prospect and under way. The output for the year will be more than 200 cars, and in the lot will be three regular models, ranging from 20 to 50 horsepower. The capacity of the plant will be increased as the market for cars of this quality may demand.

Another great corporation, and in some ways the most remarkable concern to seriously consider the automobile as a mechanism worthy of a prominent place in its product, is the Westinghouse companies. Already the French branch, the Société Anonyme Westinghouse, of Havre, with a splendidly equipped plant for the manufacture of electrical machinery, has been turning out chassis for some time after design by Albert Schmid, director and consulting engineer of this allied company.

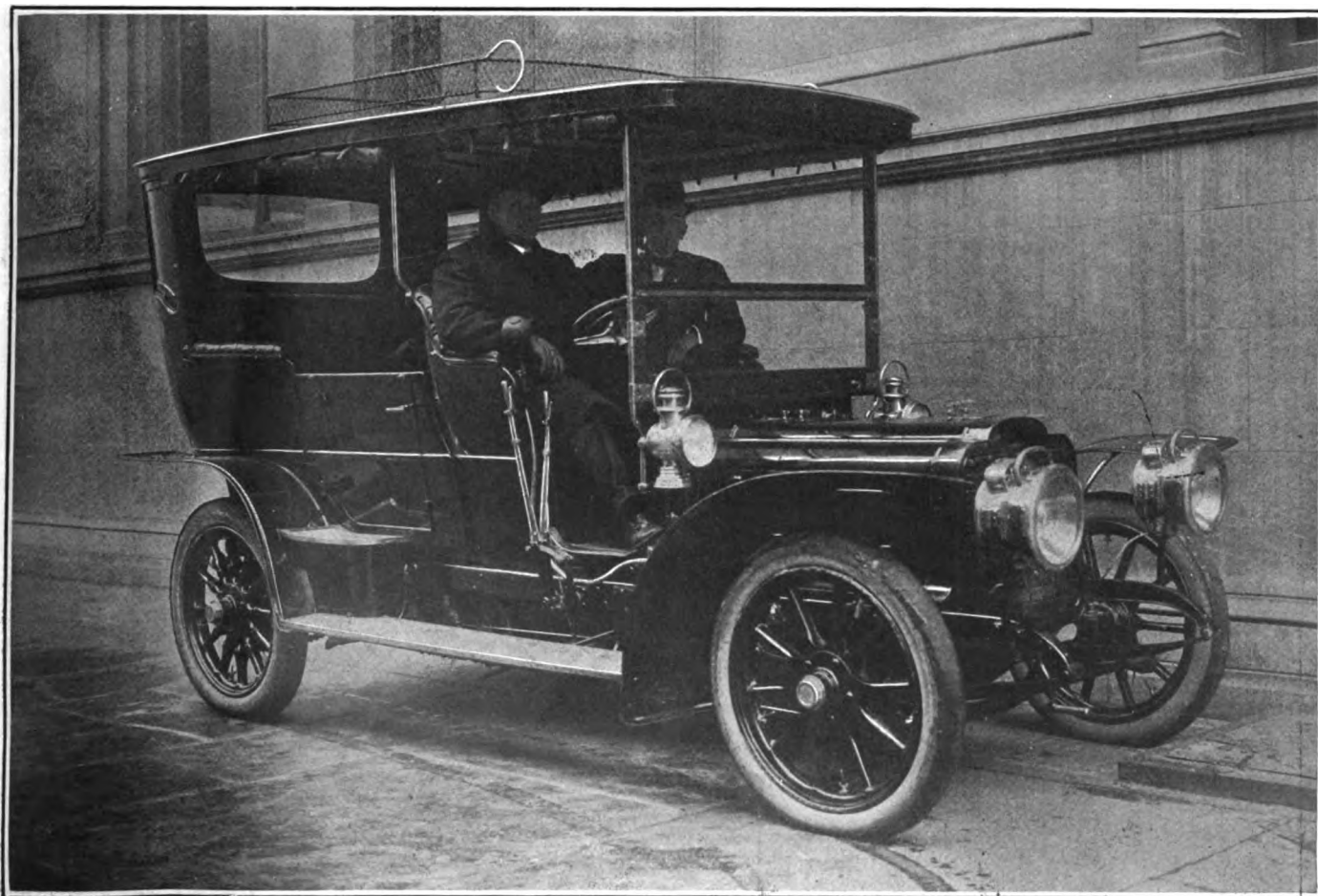
At the Armory show a beautifully finished 30 horsepower chassis was on view and attracted the serious attention of the engineer and the tradesman. The mechanical features involved, while not of startling novelty and along the lines of established practice, are carried out with the greatest

skill, with here and there a decided touch of originality. The water-cooling of the brakes and the carburetor are Westinghouse ideas and the limiting governor is an uncommon attachment.

In the selection of metals entering into the construction the widest possible range has been given to a choice, each vital part of the mechanism being made from such steel alloys as seemed best fitted to the particular work in hand, nickel-steel of various grades and nickel and chromium alloys being used without reference to initial cost. The chassis shown is the production, in its entirety, of the French house, and is sold for 25,000 francs f.o.b. at Havre.

Whether or not the parent company, with its principal works at Pittsburg, will undertake the manufacture of a duplicate chassis and other models is as yet a matter under consideration, but the probabilities all point that way. If the decision is favorable, it will mean that the entire available resources of the vast Westinghouse interests will be at the disposal of the automobile branch of the business, and with its great magnitude, splendid organization and unified spirit, the possibilities of the company will be well-nigh limitless.

Another significant fact brought out prominently at the recent shows is the added attention given to the automobile by such great American establishments as the



AMERICAN MORS TOURING CAR BUILT BY THE KOBUSCH AUTOMOBILE CO. AND SHOWN FOR THE FIRST TIME IN NEW YORK.

Bethlehem Steel Co., the Midvale Steel Co., the William Cramp & Sons Ship and Engine Building Co., the Carpenter Steel Co., and the foreign house of Krupp.

While each of these companies has for some time been supplying a large number of automobile manufacturers with a variety of materials, this is the first year that has seen comprehensive exhibits made at the automobile shows. The firm of Krupp, at Essen-Ruhr, has probably furnished more automobile parts and materials to Continental manufacturers than all the other producers of Europe, and the business is so well established as a branch department of the works that no element of novelty enters into consideration save that it is the maiden appearance of the company as an exhibitor at an automobile American show. The condition in this country is not quite the same as in Europe, the American automobile manufacturer only recently demanding steels and materials of the highest order in such considerable quantities as would justify the largest producers in making a special effort to cater to this department of the business.

That such concerns as the Midvale, Bethlehem, and Carpenter steel companies are for the first time represented with comprehensive exhibits at automobile exhibitions, indicates their appreciation of the growing

demand in this country for steels of the highest degree of excellence for the construction of automobiles.

This appreciation could only come with the belief in the stability and importance of the automobile industry, and in the earnest

endeavor of the manufacturer to bring his product to the highest possible degree of excellence. Regarded in such a light, it is a hopeful and significant sign of the growth and permanence of the self-propelled vehicle.

Some Features of Technical Interest.

THE first nervous look for something new did not find many points of attraction, but the next couple of rounds through the Garden and Armory made it clear that a systematic search was the only method of obtaining valuable information. Taking one car detail after the other, the comparison brought forth such a vastness of interesting material that the investigation had at once to be confined to a limited number of details. It would take months, and not one week, to digest the tremendous amount of valuable improvements which, hidden to the casual observer, were stored within the compass of rather similar exteriors.

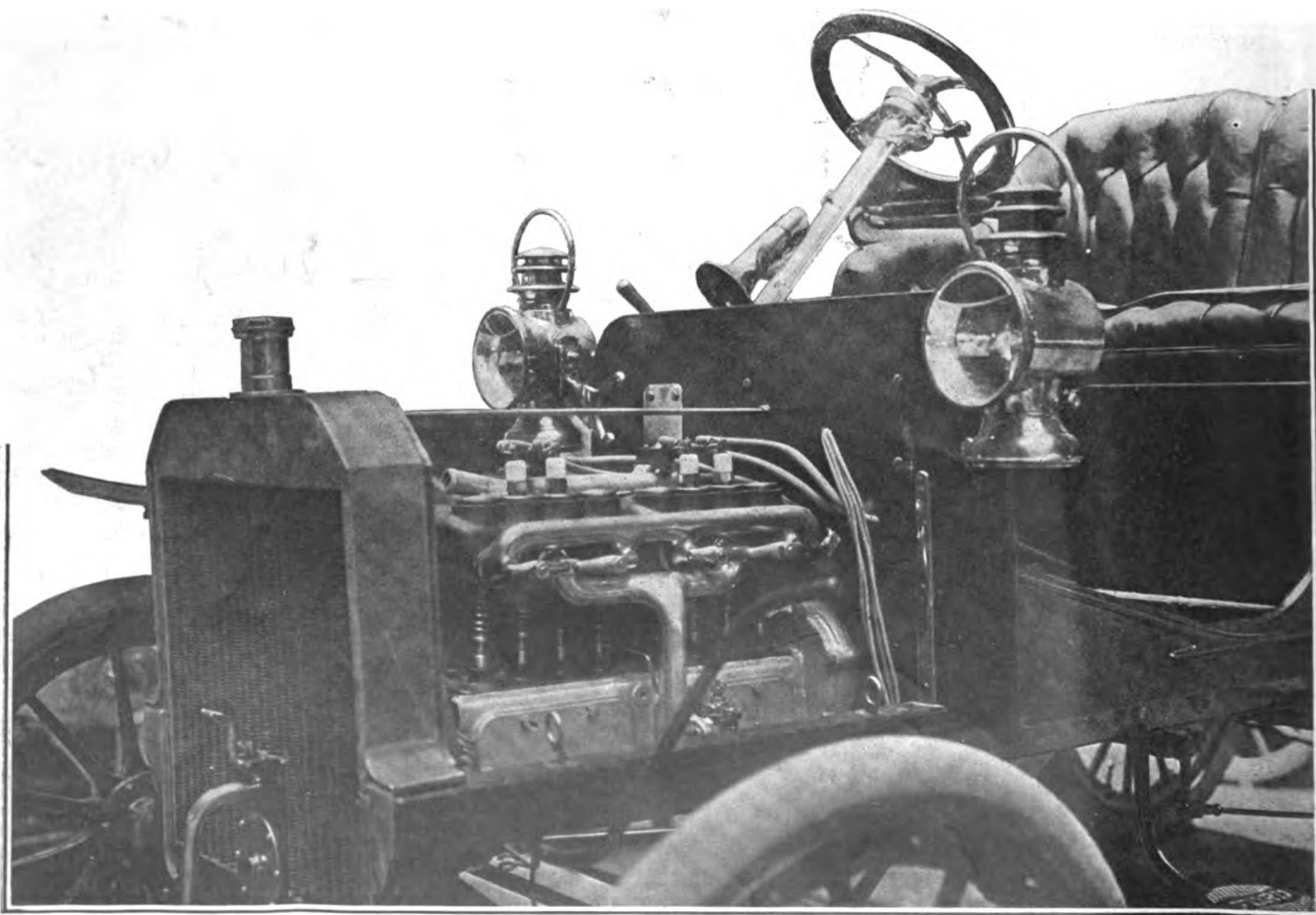
It is therefore impossible to do justice to the hundreds of ingenious details and their originators without the compilation of an indexed show dictionary.

It is natural that the cleverly heralded \$500 four-cylinder motor-in-front Ford run-

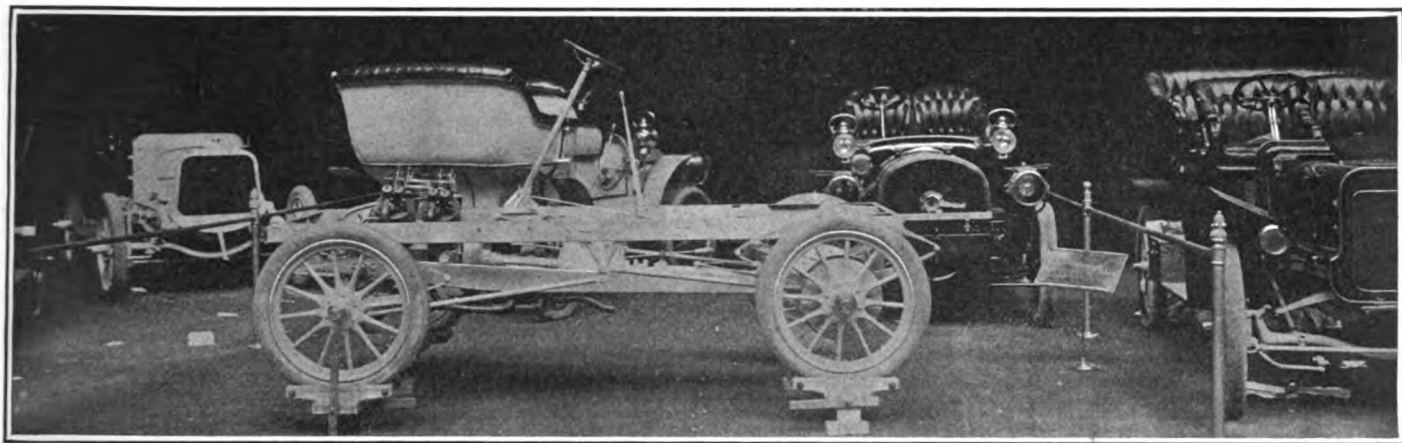
about proved a strong magnet for the knowing and unknowing. To do justice to this commercial novelty is not an easy proposition, for two reasons: First, it was extremely difficult to get at the details of the construction, so great was the crowd which surrounded the car from morning until night; and secondly, there are no acknowledged performances available to form a basis of criticism.

As far as the general design is concerned, it must be frankly stated that it appears to be the product of a wide and practical experience as well as the ability to combine simplicity with effectiveness. On some of the details the tendency to produce a light car is, at first sight, of a rather startling character, which shows, however, on closer examination, good mechanical reasoning.

The frame is of tubular truss design, axles and steering knuckles probably of excellent



INLET SIDE OF ENGINE OF THE NEW FORD FOUR-CYLINDER RUNABOUT, THE FEATURE OF THE ARMORY SHOW.



MARMON EXHIBIT IN THE ARMORY SHOW, WITH DEMONSTRATION CHASSIS MOUNTED ON BLOCKS TO SHOW FLEXIBILITY OF SUSPENSION.

material, judging from their dimensions, and the hanging of motor and transmission simplicity itself. The steering device seems, at first, direct, until the information is gleaned that a little box right under the steering wheel contains the induction gearing, which seems a novel idea, surprising in the fact that it was possible to design it with such novel compactness. The change speed gear is of the planetary type, operated by a side lever, and is directly connected with the motor shaft without the interposition of a clutch under separate pedal control.

Lubrication has been provided for all essential working parts; splash system for the motor under the supply of an Essex exhaust force feed oiler. A regular Splitdorf coil is seen on the dash. A radiator, the product of a well-known firm, forms the front of the car. The rear hub brakes are operated by a foot pedal, the mate of which engages a transmission brake, while a third pedal produces reverse motion.

The outside appearance of the car makes a pleasing standard impression. The accessories visible on the outside are of known value, and the demonstration ride of the usual favorable four-cylinder car impression.

These general characteristics of a car of such attractive appearance lead to the conclusion, that good material must have been used to secure lightness and retain strength and that only the vast number of cars to be produced and a small margin of expected profit enabled the maker to offer it for a price which is startling when compared with the general specification of the car.

The car of direct opposite characteristic is the new Northern. Appearing without any warning, without unusual valuation and departing in many important points from standard lines of construction, it shows in almost every vital part originality combined with ample provisions for certainty of operation.

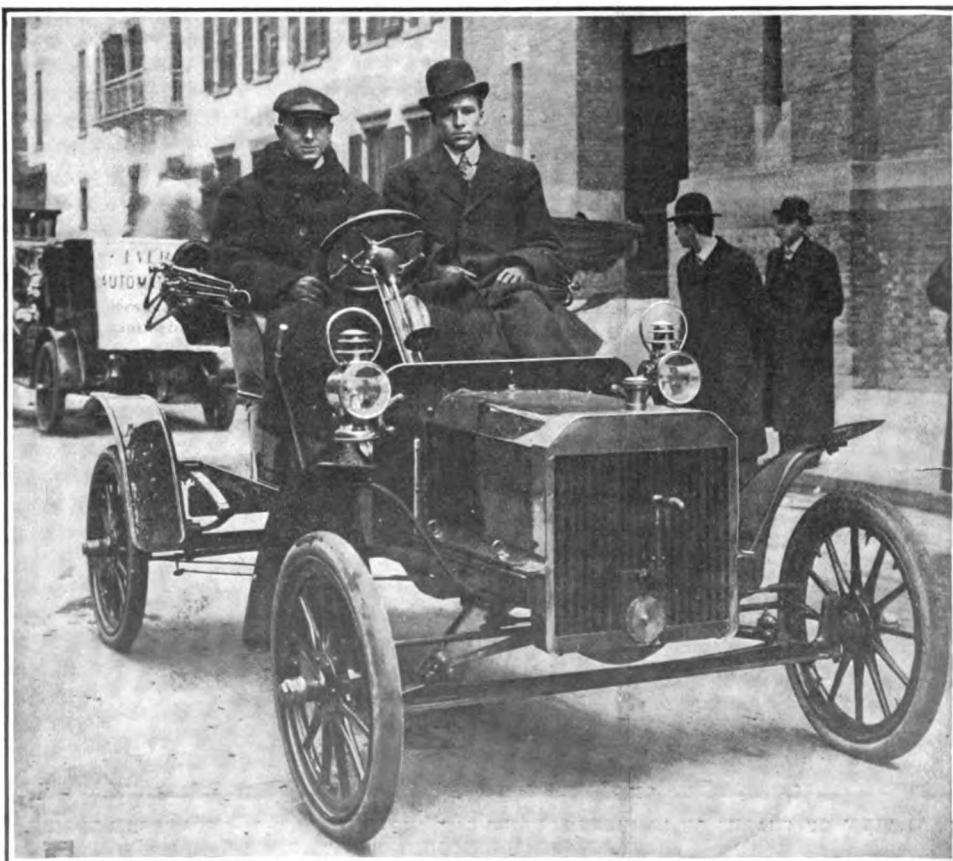
To make a quadruple cylinder casting in one piece with the crankcase is a decided novelty in automobile construction and must, without inspection of internal arrangement and consideration of machining problems, contain decided points of advantage, especially in regard to stiffness of the supports of working parts.

The special arrangement of the spark plugs screwed into special fixtures forming an auxiliary combustion chamber is uncommon and of merit. The arrangement of a flywheel of unusual large diameter makes for the quietness of the engine, acting at the same time as a fan and vacuum destroyer at the rear end of the car, all showing a broad study of automobile problems.

The entire control scheme is also of decided novelty, as the gear box (a unit either with the motor or rear axle differential casing respectively in the two models shown) is actuated by a hand wheel superimposed on the steering wheel for going ahead and for the reverse by a foot slide protruding from a slot in the base of the steering column.

The throttle lever located under the steer-

ing wheel also actuates the pneumatic clutch, which in itself, as well as the air brakes, is not only rather an exception in automobile engineering, but also original in design. The ratchet starting device, the use of the two-to-one gear as a circulating pump, are also of unusual application. Space prevents not only a complete discussion of all the novel features of this car, but even a listing of them. The general characteristics, however, indicate a tendency toward simplification, safety of operation by numerous interlocking devices, and the bold arrangement of engine and power drive in one straight line to the rear axle with the interposition of only one universal joint. In general the chassis makes the impression of simplicity and efficiency.



DEMONSTRATING THE NEW FORD FOUR-CYLINDER MOTOR-IN-FRONT RUNABOUT.

The Northern car and the Ford runabout are probably the constructions of special interest about which a final judgment would be premature at present.

It is different with the productions in the two-cycle field. It seems reasonable to expect that the example set by the four-cylinder Elmore and three-cylinder Oldsmobile two-cycle engines will bring again to the front this unjustly neglected possibility of automobile motor construction.

This renaissance of a sound principle deserves as much attention as the development of the air-cooled car, which shows an increasing number of representative makes from year to year.

The thorough design of the Knox four-cylinder, vertical motor-in-front chassis, with its double-bevel gear transmission construction, is a fair example of the importance which the air-cooled car has assumed. This year's cars show a state of perfection that is the legitimate outcome of long, practical road experience.

Of cars fitted with air-cooled motors the Frayer-Miller, employing forced draught in cylinder jackets, was a constant center of interest, though of course no longer a novelty.

A five-cylinder, air-cooled motor (the Carey), revolving around its crankshaft, was the only decidedly novel construction in the air-cooled line, interesting, especially, for the fact that the manufacturer claims to have overcome the main difficulty with such motors in preventing the running dry of bearings by the centrifugal motion of the oil under high motor speed. It would exceed the limits of this article to go into the details of simplification possible with such construction, and only the absence of fan or blower, muffler and camshafts may be specially mentioned.

The well-known arrangement of the inclined cylinders in the Marmon air-cooled car has again attracted special attention by its main feature of providing for an ample body of air and free passage of the air

all around the cylinders, not always a characteristic of air-cooled, four-cylinder motors with the fore-and-aft arrangement of cylinders.

The peculiar suspension system of this car having been recently discussed in detail in these pages, its mere mention may be sufficient. In the Armory the chassis was so mounted that its flexibility was easily demonstrated to the visitor, and it seemed to make a considerable impression.

The new Aerocar was received with favorable interest by the critical, its merits being acknowledged from the fact that it embodies the well-known Reeves air-cooled motor, and its other elements are of well-known efficiency. It will be interesting to watch developments in this rapidly-moving enterprise.

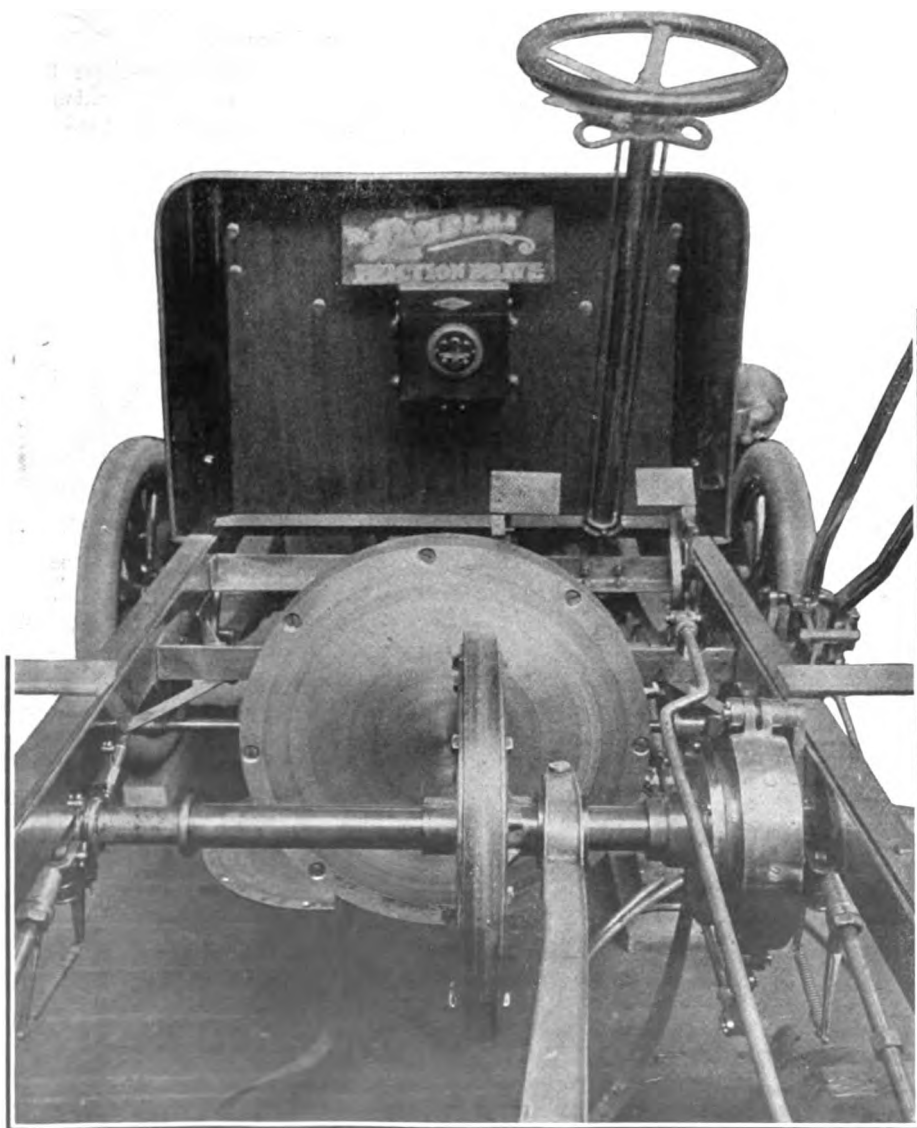
In combination with air-cooled motors the Orient friction drive buckboard apparently offers neat appearance, combined with low price. In this construction a friction drive of proper design and material is specially suitable on account of the small weight of the car.

The possibilities of the friction drive were lucidly presented to always a considerable group of spectators at the stand of the Lambert automobile, which construction naturally showed an increase of dimensions adequate to the weight of the car. Aluminum composition and paper friction surfaces are employed for the transmission disks. In practical operation both vehicles give only a limited number of speeds, as indicated by the notches on the speed-lever sectors. These notches are probably used to prevent any creeping of the sliding wheel.

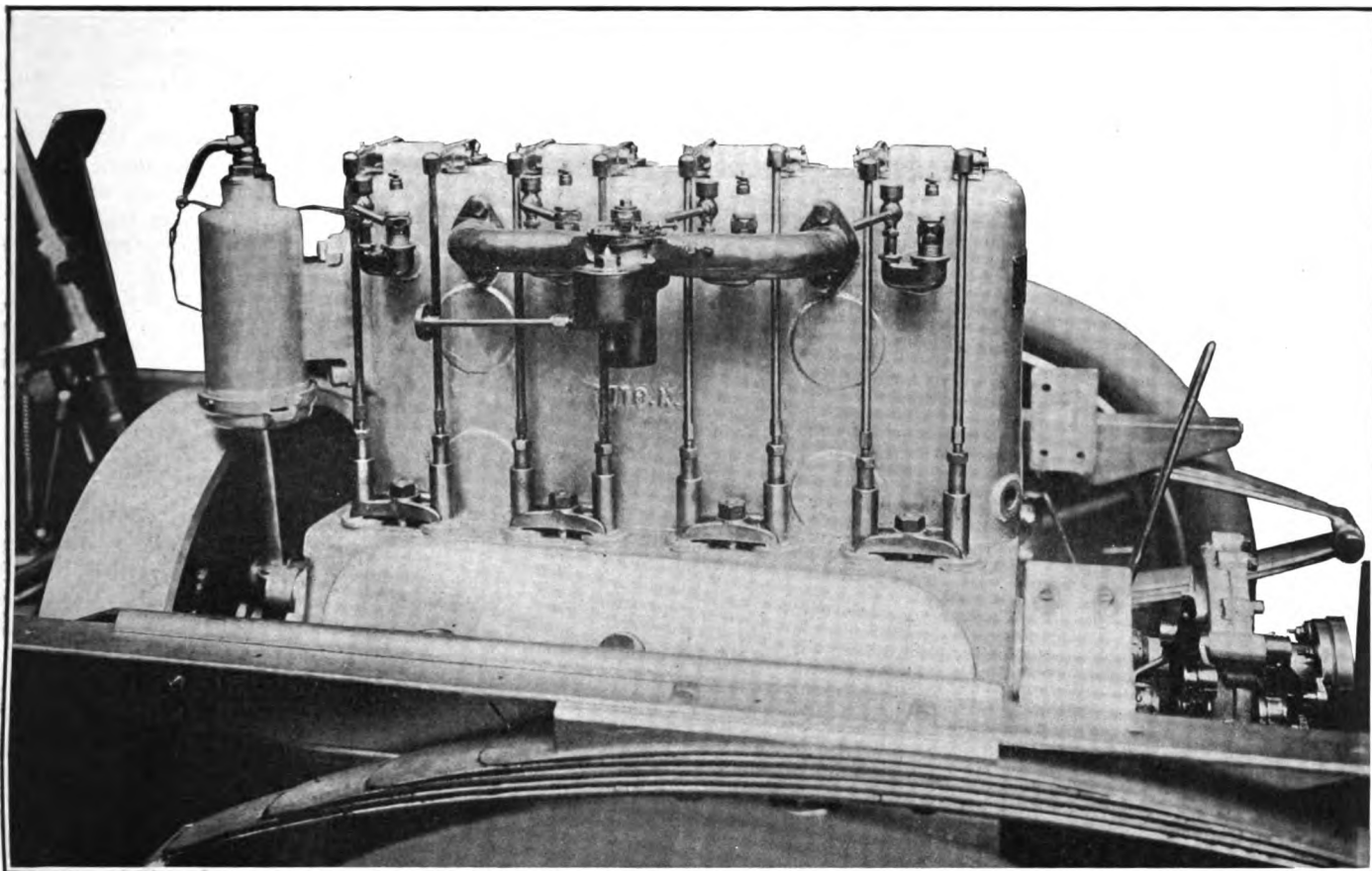
Other friction systems shown were the Windsor and the Gearless transmissions, in the Armory. The practical operation of these systems will be watched with great interest, for it is undeniable that an efficient friction drive would provide the ideal form of change speed construction for automobiles, and especially for commercial vehicles.

Regarding other details of car construction, the retention of armored wood frames in the Spyker, Panhard, C.G.V., Electrette, Lansden truck, and Pope-Hartford cars seems to indicate a desire to lighten car frames and to increase their elasticity at the same time.

The old question as to whether the driver of an automobile should sit on the right-hand side or the left finds illustration in the fact that a majority of the commercial cars have the steering wheel on the left-hand side. This position seems to be the accepted one for convenience in operating the car and for best observing the possibilities of making progress in a crowded thoroughfare. In view of the existing road laws in this country it seems logical to place the steering wheel on the left, just as location on the right-hand side seems logical for vehicles in the British Isles, where the custom in passing is the reverse.

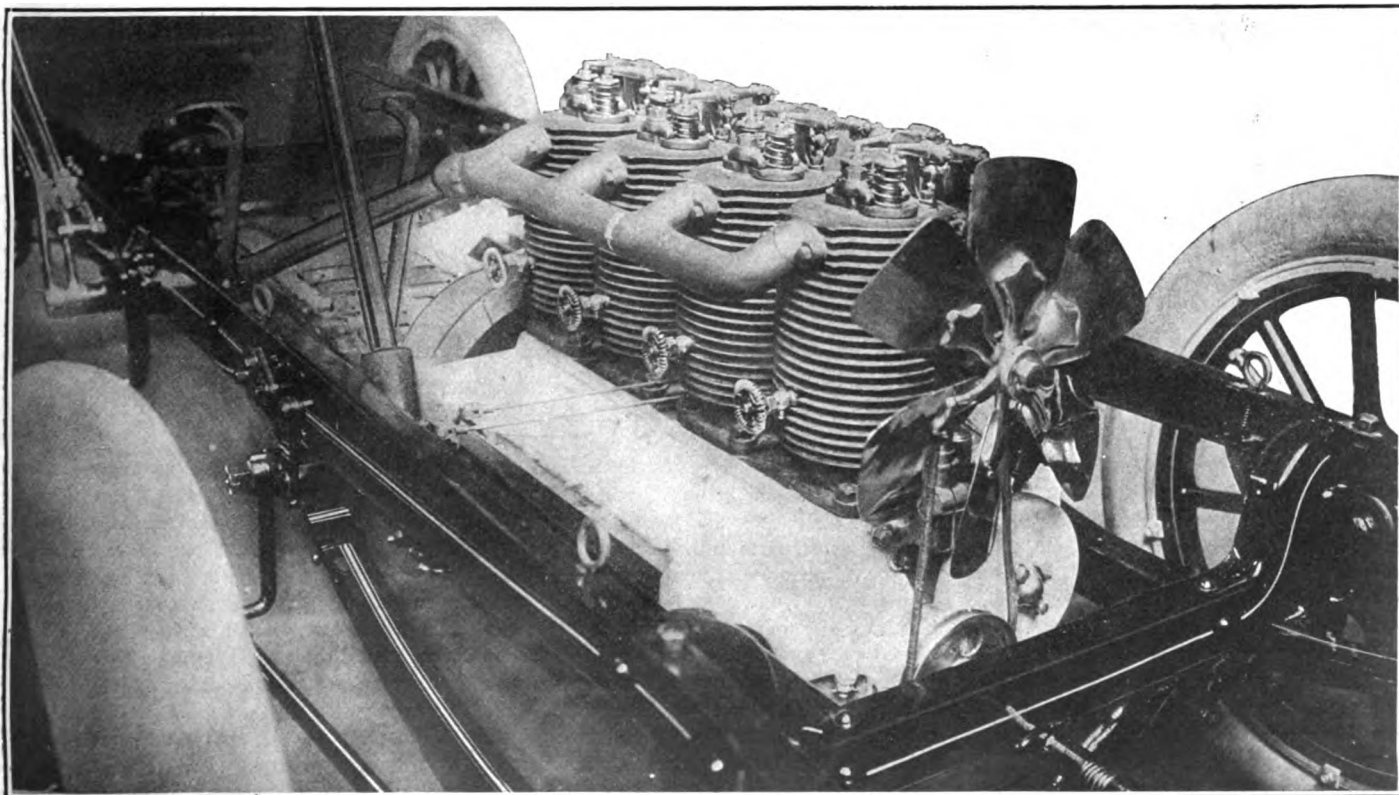


PART VIEW OF CHASSIS OF LAMBERT TOURING CAR, SHOWING FRICTION DRIVE FROM ENGINE SHAFT TO SIDE CHAIN COUNTERSHAFT



MOTOR OF THE NEW NORTHERN TOURING CAR EMBODYING MANY NOVEL FEATURES—ONE OF THE MOST ATTRACTIVE EXHIBITS IN THE GARDEN SHOW.

Note:—Cylinders and crank case are in one casting. Air pump on left of engine supplies compressed air to operate clutch and brakes. Spark plugs are attached to casting forming supplementary combustion chamber. Two-to-one gears are used as water pump.



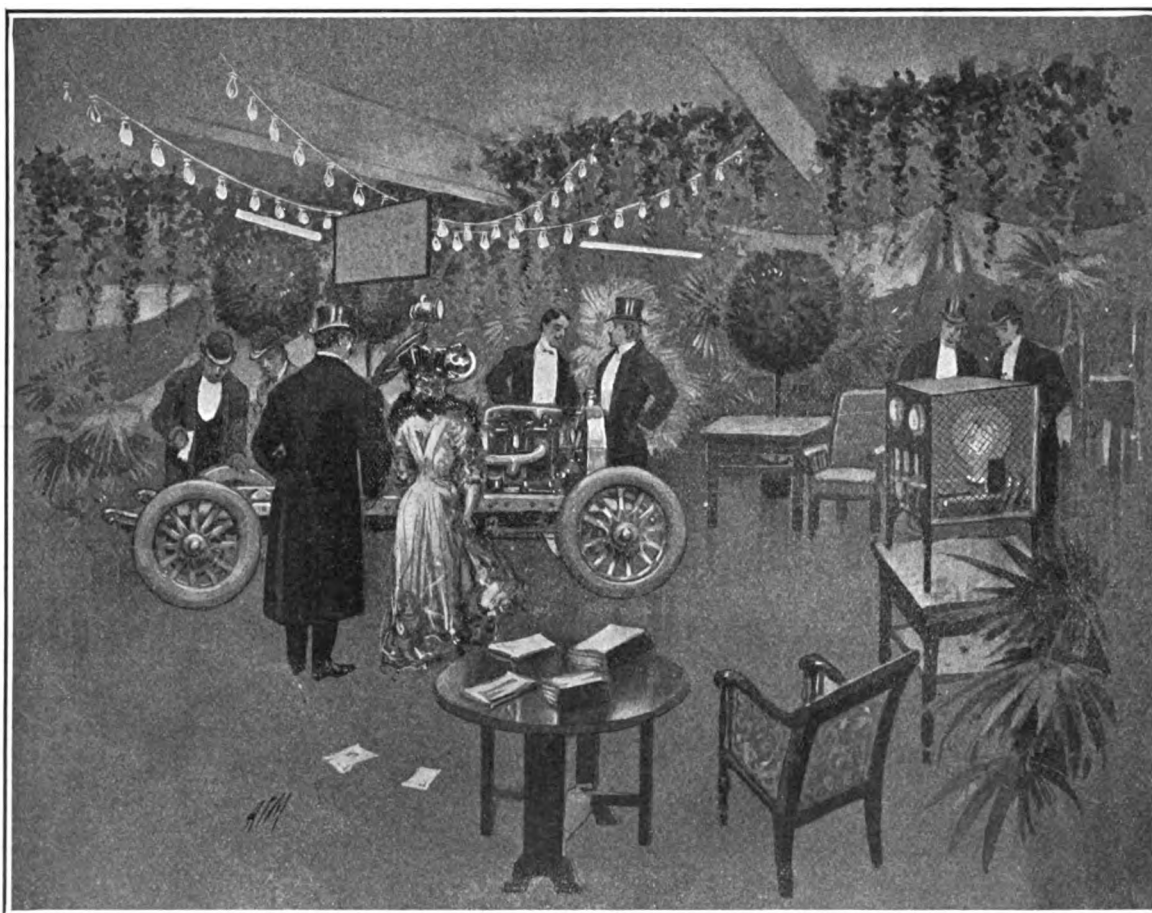
FRONT END OF CHASSIS OF THE AEROCAR SHOWING THE FOUR-CYLINDER REEVES AIR-COOLED MOTOR. A NEW EXHIBIT SHOWN FOR THE FIRST TIME IN NEW YORK AT THE ARMORY

COMMERCIAL VEHICLES AT THE SHOWS.

TO a majority of the visitors to the New York automobile shows, to a majority of those who read published reports of the shows and to the "general public" the great exposition—for it was in effect but a single exposition housed in two buildings—was arranged primarily for and consisted chiefly of pleasure cars. In point of numbers and in spectacular display this is true, and it is also true that the pleasure cars shown were far in advance of the cars of a year ago, both in numbers

while in 1906 the exhibitors of commercial cars are, almost without exception, builders of vehicles designed wholly and exclusively with a view to carrying the burdens of commerce. These facts speak for themselves, and hardly need the backing supplied by the several manufacturers who stated that the combination of pleasure car and delivery wagon was a failure, though the experiment was inevitable and the experience gained was essential in producing cars properly fitted to meet the demands of commercial

ments, but who knows how to pull the levers, press the pedals and steer. This is, of course, an extreme view, and its diametric opposite is entertained by the manufacturer who wants a factory-trained expert on each car, and is willing to go to considerable trouble to train men for such work. The first holds that a man who does not know the difference between the spark plug and the gasoline tank, or between the armature shaft and the battery terminals, cannot be tempted to "adjust" things until they re-



INTERIOR OF ROOM IN ARMORY FITTED BY WESTINGHOUSE COMPANIES FOR EXHIBITION OF CAR CHASSIS, MERCURY VAPOR LAMPS AND CONVERTERS, AND AIR COMPRESSOR FOR INFLATING TIRES.

and in mechanical excellence. It is not putting the case too strongly, however, to assert that the exhibit of commercial vehicles was of greater real importance and held a deeper significance than anything else shown. A few facts in this connection will be of interest.

There were about a hundred per cent. more exhibitors of commercial automobiles at the 1906 show than at the 1905 show; but even this great increase does not adequately represent the true status of the matter, because in 1905 a large proportion of the commercial cars, so-called, consisted of pleasure car chassis carrying light delivery bodies,

work, so different from the calls made on pleasure cars. The beneficial effects of hard experience are shown on every hand, in the massive proportioning of parts, the increase of power, the decrease of speed and the banishment, from the heavier classes at least, of the mirror-like finishes seen on pleasure cars. The fact that no hired driver will ever handle a truck in the way an automobilist handles his own pleasure car has received due attention—so much so, in fact, that one manufacturer emphatically voices his preference for a driver who is absolutely ignorant of the working of the motor, who knows nothing whatever of making adjust-

fuse to function, but can readily learn to handle the controlling levers intelligently and will do it much more cheaply than an expert who could be trusted among the machinery; also, that the non-mechanical man is easy to find, while the expert is a luxury. It is argued that if the car is properly built it will more than pay to take it to an expert repairman on the few occasions when attention is required.

The advocate of expert drivers believes that it pays to employ trained men, able to meet any emergency and do most of their own adjusting and repairing. Another argument is that eventually practically all



ATLAS THREE-TON GASOLINE TRUCK WITH ENGINE ON REAR AXLE.

motor truck drivers will become comparatively expert, just as the average horse truck driver of to-day knows enough to take intelligent care of his horses; and that the sooner the educative process is commenced, the better. As a matter of fact, the majority of manufacturers, especially of gasoline trucks, incline toward the latter attitude and make their trucks as substantial, simple and easily understood as possible, while reducing the necessity for adjustment to the minimum. These questions apply to electric vehicles in a lesser degree, for the battery, the source of the great majority of electric vehicle troubles, is necessarily always handled by specialists, and the mechanism presents little or no opportunity or temptation for the driver to "tinker."

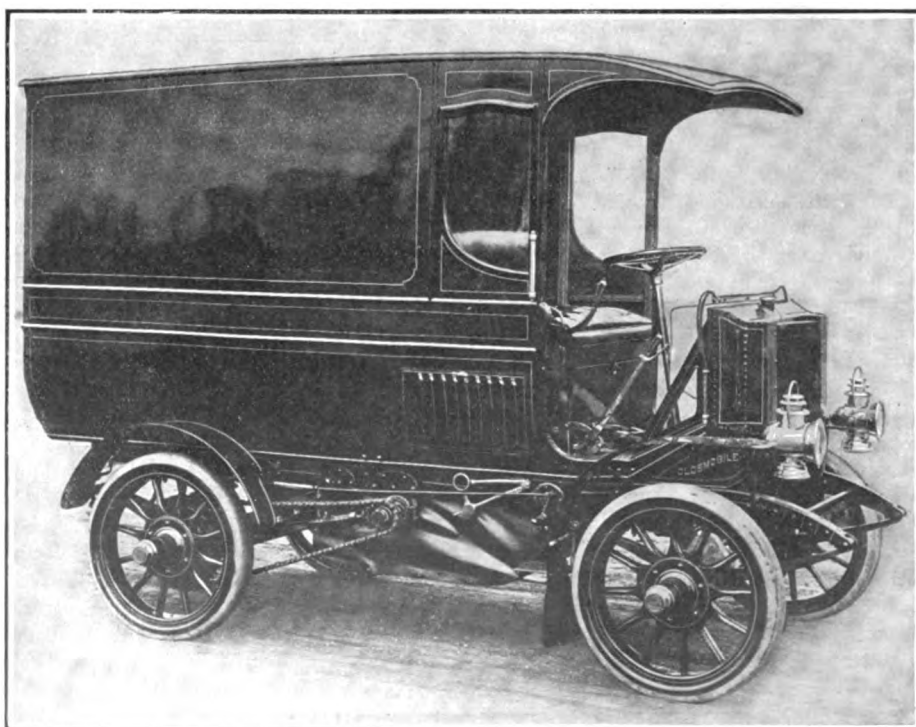
The attitude of the truck-using public toward the power commercial vehicle is such as to be exceedingly encouraging to the builder. Numerous tentative purchases have been made in the past, and in not a few cases the results have been below expectations. The business man has seen, however, the possibilities of the practical vehicle, and is ready to try again, knowing that improvements are being made constantly. In many cases the experiment has proved a success and the business man and those who have watched him are ready to purchase more trucks, especially in view of the likelihood of obtaining better results from improved vehicles.

If the motor truck was merely a means for advertising a business; if it was merely a little more convenient, or a little quicker than the horse-drawn truck; if it merely did the same work at about the same cost, the business man would not consider its purchase for a moment. The automobile builder's proposition, however, is that the motor truck is a saver of money, and a proposition to save money is the surest way to sell trucks. The manufacturer has

reached a stage in the development of his machines where he has a good deal of well-founded confidence in their ability to do what they are built to do, and in several instances the business man is offered a guarantee that the motor trucks will do a certain per cent. more work in a given time than an equal number of horse-drawn trucks, with a certain percentage of saving. A proposition of this kind coming from a responsible concern cannot pass unnoticed, for it is a matter of dollars and cents—what the average man is in business for. If a truck builder can demonstrate the truth of his assertions in actual work, orders are assured. A careful survey of the situation

would seem to show that motor truck builders are "making good" in so many instances that the increased number of exhibits, the improved quality of the machines, the increasing demand for them and the increasing numbers seen on the streets of our large cities are the logical results.

Automobile stages and other passenger-carrying automobiles for public service are somewhat peculiarly situated. Though their reliability and practicability have frequently been proved, they are not usually profitable when brought into direct competition with steam railroads and trolley lines in localities where there is much travel, while localities where no such competition exists are, as a rule, sparsely inhabited and not heavily traveled. Under certain conditions, however, automobile passenger service is very successful, as has been conclusively proved. For instance, passenger and light freight work is profitable where it is possible to secure the combined business of several small villages, all at a distance from a railroad station and none reached by a trolley line. Newly opened territory where railroads are scarce offers exceptional opportunities for motor stage work; the sight-seeing automobiles that ply in the larger cities are familiar to the public, and short routes in mountainous districts, where railroads are impracticable, are, in a number of cases, covered by automobiles carrying both freight and passengers. The fact that the mails are entrusted to automobile stages in many instances is an indication of the reliability of the motor vehicle. Passenger work is nearly always of special character, requiring special arrangements of car and body; the machines usually consist of regular truck chassis fitted with passenger bodies and, perhaps, geared to a rather higher



OLDSMOBILE COVERED DELIVERY WAGON WITH 16-H.P. GASOLINE MOTOR.

speed than is considered advisable for freight work.

Manufacturers of commercial cars are unanimous in the opinion that the field is enormous, and that the concerns now building reliable trucks will in a short time be unable to meet the demand. The representative of a concern which has only recently placed a commercial machine on the market expressed the opinion that the wisest manufacturers are those who early commenced work along commercial lines and were prepared to enter the field with well-trying vehicles. "My firm," he said, "did not think very seriously of entering the commercial field until a couple of seasons' use of a truck for its own freight work brought the conviction that it was only necessary to show business men what a good motor truck would do to create a demand that meant vastly more than the demand for pleasure cars, notwithstanding that the latter were selling just as fast as they could be turned out. The result is that we are giving the truck question a great deal of attention; and the public would hardly believe the amount of time and money that is being spent by automobile builders generally for the purpose of developing good trucks. The keen competition among pleasure car builders is awakening the eyes of manufacturers to the fact that there is a field where for a long

possesses a monopoly of good points. Builders of electric trucks cheerfully admit that for long-distance work and for service where it is difficult or impracticable to obtain direct current, the gasoline car is superior; while builders of gasoline cars are usually willing to acknowledge the advantages of the electric car for house-to-house delivery or service where the vehicle must make stops at short intervals.

Again, the builders of electric commercial cars feel that this class of machine has earned for itself an undisputed position and a reputation for usefulness that cannot be denied; while the gasoline car builder, knowing the developed qualities and the latent possibilities of his car, is not only hopeful, but confident of success.

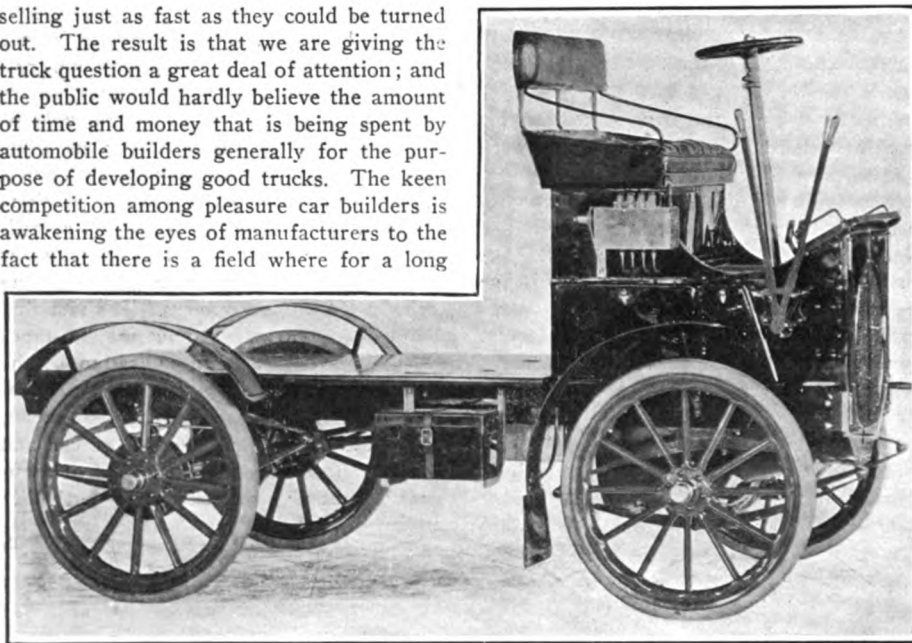
As in the case of pleasure cars, various types of motors are used, and all seem to meet the requirements. Air-cooling and

Many of the commercial cars exhibited have been described and illustrated in previous issues of THE AUTOMOBILE. The leading and characteristic features are here given, however, and will give the reader an excellent idea of prevailing practice in commercial cars on this side of the Atlantic. It is rather interesting to note that only American commercial cars were exhibited, the commercial field not being cultivated by foreign builders, whose attention, so far as this country is concerned, is centered on the pleasure car.

The Packard Motor Car Company, of Detroit, Mich., manufactures only one commercial chassis which, however, can be fitted with any style of body desired. This machine has a carrying capacity of 3,000 pounds and is equipped with a double-cylinder, vertical water-cooled motor rated at 14 horsepower placed under the driver's seat. The motor is of the same type as the Packard touring car motor, though having only half the number of cylinders, and drives through an internal expanding clutch, three-speed sliding gear transmission and side chains to the rear wheels which are mounted on a solid rear axle made of two-inch square forged steel. Maximum speed, 12 miles an hour. Ignition is by jump spark, with a storage battery supplying the current. The regular touring car carburetor is used. The frame is of armored hard wood and is carried on semi-elliptic springs, the rear springs being three in number and of the platform type. Wheels are 34 inches in diameter in the rear and 32 inches in the front, and run on roller bearings; the steering knuckles turn in ball bearings. Balls are also used in the transmission. Wheelbase, 97 1-2 inches; tread, standard. Tires are of solid rubber, 3 1-2 inches in diameter. The brake system is the same as on the Packard touring cars, and consists of a drum on each rear hub, with an internal expanding ring and an external contacting band on each drum, the exterior brakes being used for regular service and the internal rings for emergency work. The radiator is tubular and is placed at the front of the car, below the dash; the total water capacity is seven gallons. Eight gallons of gasoline are carried; the manufacturers state that in actual service, with loads varying from full capacity to nothing, the truck averages ten miles to a gallon, giving a radius of about 80 miles on a tank of gasoline.

Requirements vary so much that no attempt is made to make any one type of body standard; the truck is regularly supplied with no body, but merely a driver's seat. Designs can be furnished and bodies built, however, in many styles, or the purchaser can have a body built to suit his own special needs.

A 2,000 pounds capacity delivery wagon with gasoline motor was exhibited by the Olds Motor Works, of Lansing, Mich.; though the car is conservatively rated at one ton the manufacturers state that it will



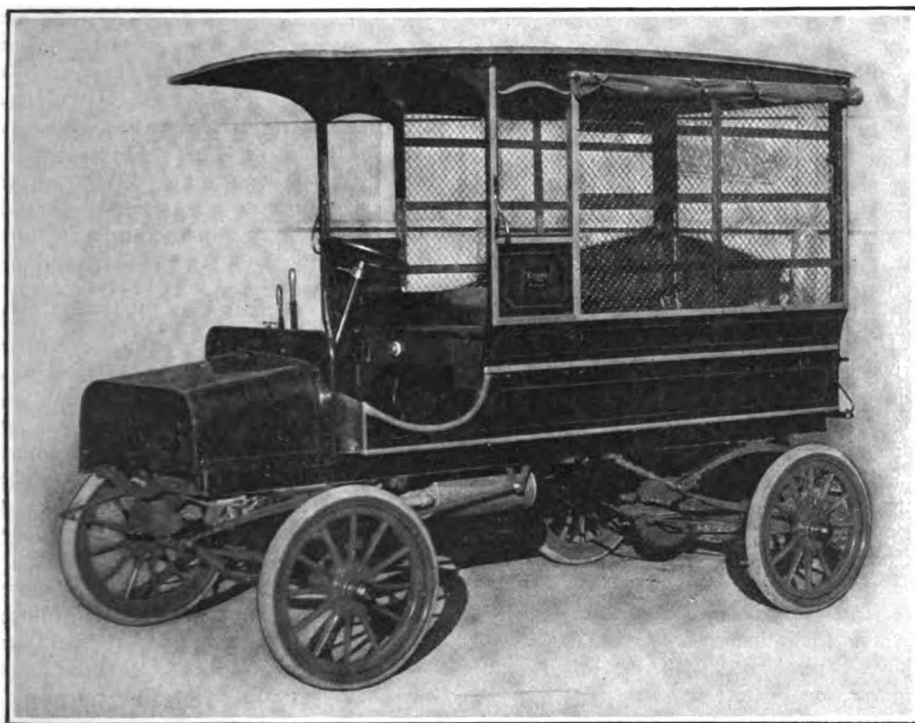
FRANKLIN ONE-TON TRUCK WITH 4-CYLINDER, AIR-COOLED, 12-H.P. MOTOR.

time there will be plenty of room for every one who has the right vehicle."

So far the question of motive power has not been touched upon, commercial cars being referred to as a class. This year the gasoline truck has come into prominence with a rapidity that is astonishing, while electric vehicles are widening their field of usefulness continually. Steam for commercial work does not find the favor in this country that it does abroad, and no commercial cars propelled by steam engines were seen at the New York show. While there is naturally much rivalry between the manufacturers of electric and gasoline cars, there is a distinct and gratifying absence of inclination to belittle one another's cars; this is doubtless due in a large measure to the realization of the fact that there is more to be gained by pointing out the good qualities of one's own machine than by abusing the cars of other makers; and to the knowledge of the fact that no one type of machine

water-cooling are each used, examples of both types being prominent in actual service. Engines are built with one, two or four cylinders and are placed with cylinders horizontal and vertical, some under a hood in front, some under the driver's seat and some under the body and even on the rear axle, the latter form being adopted by a prominent concern. There is no uniformity of practice in transmission gears, clutches or driving systems. Side-chain drive is found on heavy and light vehicles alike, while live rear axles are found not only on light delivery wagons, but on one of the heaviest of the gasoline trucks.

In point of carrying capacity the electric trucks are in the lead, so far as the show indicated. Several five-ton electric trucks were exhibited, while there was but one gasoline car of that rated capacity, and that was shown outside, demonstrating its ability by carrying five tons of pig-iron about the streets.



LOGAN 1,500-POUND DELIVERY WAGON SHOWN IN OPERATION IN THE STREET.

handle a 3,000-pound load without difficulty; the weight of the car is 3,500 pounds. The motor is rated at 16 horsepower and has two vertical water-cooled cylinders placed under the driver's seat with the shaft extending transversely. Drive is by chain from the motor to a countershaft carrying the two-speed planetary transmission, and from the countershaft to the rear wheels by side chains, the rear axle being solid. Maximum speed, about 18 miles an hour. The frame is of pressed steel; wood sills for the body are carried above it on steel brackets. Wheelbase is 110 inches and tread standard; wheels are all 34 inches in diameter and are fitted with 4-inch solid rubber tires. The radiator is tubular and is carried in front of the dash; water capacity, 10 gallons. The exhibit consisted of a chassis without body, a closed delivery wagon with rear doors and an express wagon with top and side curtains, all on the same type of chassis.

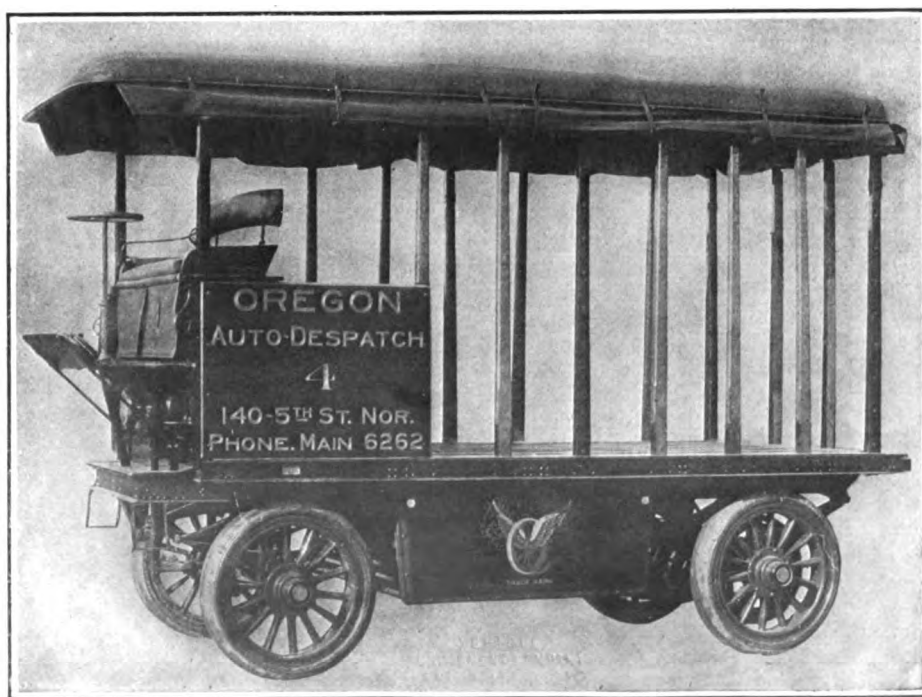
One of the recent arrivals in the commercial field is the H. H. Franklin Manufacturing Company, of Syracuse, N. Y. This concern exhibited a gasoline truck equipped with a 12-horsepower, air-cooled motor of the regular Franklin type, placed vertically under the driver's seat with the shaft fore-and-aft. The car weighs 1,400 pounds, and, notwithstanding its lightness, is rated as having a carrying capacity of 2,000 pounds. Drive is through multiple disk clutch, two-speed sliding gear transmission, shaft and bevel gears to the live rear axle. The car is geared to a high speed, considering its carrying capacity, being capable of running 20 miles an hour on the high gear. The rear axle runs on Hess-Bright ball bearings; the front axle, which is tubular, on roller bearings; the engine bearings are of

special babbitt castings made in the Franklin factory for this work; the transmission runs in ball bearings. Five bearings support the crankshaft. The framing is of wood and the springs are full elliptics and 40 inches long; wheels are 32 inches in diameter with 3-inch rear tires and 2 1-2-inch front tires, solid rubber. Wheelbase, 72 inches; tread, 54 inches.

The motor, under the driver's seat and the footboard, is so installed that it is very accessible. A large centrally divided door in the front of the motor compartment is nearly the whole width of the compartment,

and smaller doors at the sides and back are also provided. The front doors are mainly of metal grill work, allowing air to reach the motor. The transmission and clutch are reached through a trap-door in the platform, just back of the seat, and the footboard is also removable. The loading platform is regularly made six feet long, but can be made considerably longer on order, provided the normal loading capacity of the car is not exceeded. The platform is 40 inches wide. The motor is controlled through a governor acting on the throttle; the carbureter is automatic.

Prominent among the builders of commercial cars propelled by air-cooled motors is the Knox Automobile Co., of Springfield, Mass., whose vehicles are of massive design and strong construction. The Knox commercial cars embody, in modified form, a number of the characteristics of the Knox pleasure cars, the chief being the grooved-pin cooling system adopted for the engine cylinders. The largest car built by this concern is a three-ton truck, which was exhibited with a staked platform body. The chassis of this vehicle weighs 3,600 pounds; with body, about 5,000 pounds. The motor has two opposed cylinders and is placed horizontally under the body of the car; the bore is 5 inches and the stroke 7 inches, and the motor is rated at 16-20 horsepower. The drive is by a single heavy chain to a countershaft carrying the differential, and from sprockets on the countershaft to the rear wheels by side chains; the transmission is a very heavy planetary gear, and gives two speeds forward and one reverse. The dead rear axle is of steel, 2 1-2 inches square, while the front rear axle is of I-beam steel, 4 inches deep and 2 1-2 inches wide. Framing is of channel steel. The wheels are 36 inches in diam-



VEHICLE EQUIPMENT COMPANY'S THREE-TON ELECTRIC STAKE TRUCK.

eter, with solid rubber tires; the tread is wide, 62 inches, and the wheelbase is 111 inches. The loading platform, back of the seat, is 12 feet long and 5 feet 6 inches wide. The over-all dimensions of the truck are 10 feet 6 inches long and 7 feet wide. Speed, 10 miles an hour.

The same chassis may be fitted with a passenger-carrying body and the speed increased somewhat, the maximum being about 15 miles an hour. A 28-passenger stage shown was made in this way. The vehicle has six cross seats, the front one 50 inches wide and the others 72 inches wide, the total carrying capacity being 28 persons. A rack in front of the dashboard and another at the rear provides a place for carrying mail bags or light freight. A top is fitted, with side curtains, which can be lowered to enclose the entire vehicle in stormy weather.

A smaller vehicle exhibited was a delivery wagon with open body and a carrying capacity of 2,500 pounds. The power and transmission systems are the same as on the truck, with reductions in weight where necessary; the speed is higher, 18 miles an hour maximum. The wheelbase is 96 inches, tread 56 inches, and the wheels are 32 inches in diameter, shod with 3 1-2-inch solid rubber tires. The loading space in the body is 103 inches long and 45 inches wide. The wagon is furnished with or without top, and with lever steering as a standard equipment and wheel steering at an extra cost.

The lightest of the Knox commercial cars shown is a single-cylinder delivery wagon with a carrying capacity of 1,500 pounds. The engine is horizontally placed under the body; the stroke, 8 inches, is very long in comparison with the bore, 5 inches. The loading space is 76 inches long and 48 inches wide; the maximum speed of the car is 18 miles an hour. Drive is through planetary transmission and single chain to the live rear axle. Wheelbase, 78 inches; tread, 56 inches; wheels, 32 inches, with 3 1-2-inch solid rubber tires.

A truck chassis which is decidedly unusual in appearance, but apparently practical and well-built, is the three-ton truck chassis shown by the Hewitt Motor Co., of 10 East Thirty-first street, New York. The first impression given by this machine is that the frame is extremely massive. This appearance is caused by the fact that the pressed steel members of the frame and sub-framing are very deep, though not excessively heavy, the chassis weighing 5,000 pounds with body. The wheels are large and of great width, each wheel being fitted with two solid rubber tires. The next feature to attract notice is the engine. This is of the four-cylinder vertical type, water-cooled, and is placed under the driver's seat. The four cylinders are cast in a single piece, with water jackets, heads and valve chambers integral; instead of the usual closed crankcase the cylinders are supported on steel columns, marine fashion,

diagonal braces being used to give stiffness.

No less than three means are provided for obtaining the ignition spark in order that danger of stoppage from ignition troubles may be reduced to the minimum. A magneto supplies current for a low-tension make-and-break system, and a battery can be switched into the circuit in case the magneto is disabled. Another set of batteries operates a jump-spark system through a vibrator coil.

The motor is rated at 25-horsepower, and drives through a heavy planetary transmission and side chains to the rear wheels. Main bearings are of babbitt, lubricated by force feed, the lubrication of the entire machine being automatic and requiring no attention beyond the filling of the oil tank. Connecting rod and other engine adjustments can be made without taking down the motor or removing any of its parts; the motor is protected from dust and dirt by a steel pan underneath and a steel cover above. Spiral gears with very broad wearing surfaces operate the camshaft.

A feature that should be useful in a commercial car is that the entire motor can be removed and another substituted in half an hour, thus an extra motor can be kept on hand, and if repairs or extensive adjustments are necessary to the regular engine the spare one can be put in its place and the car kept on the road practically without loss of time.

The two forward speeds and reverse are operated by pedals, there being a separate pedal for each change. A good feature of this arrangement is that the initial movement of any pedal automatically disengages any speed that may have been previously engaged. The friction bands are so arranged that they cannot be made to engage "fiercely," and the transmission is in these ways protected from damage due to careless manipulation. The friction surfaces are exceedingly broad to give long wear; the bands are of steel, lined with fiber, and work on cast iron drums. While provision is made for oiling the friction surfaces, the manufacturers state that it matters very little whether oil is used or not, the co-efficient of friction being almost the same with or without oil. The clutches are said to be unaffected by dirt or water.

Roller bearings are used in the wheel hubs. Brakes are expanding in the rear hub drums, the friction surfaces being fiber on cast iron. The gasoline tank, under the driver's seat, holds 50 gallons. Wheelbase, 120 inches; tread, 66 inches; wheels, 36 inches; loading platform, 12 feet long and 6 feet wide.

A smaller chassis exhibited by the same concern is similar to the chassis of the Hewitt small pleasure car. This chassis was also shown, fitted with a delivery body with rear doors. The engine is of 10-horsepower, with a single horizontal cylinder under the body. With body, the machine weighs 1,700 pounds, and has a rated carry-

ing capacity of 1,000 pounds, though the manufacturers state that 1,500 pounds is not a serious tax on the car. The machine embodies some of the features of the large truck, such as removable engine, automatic force feed lubrication, three-pedal control of the planetary transmission with interlocks, and wide wearing surfaces on friction bands and drums. The body can be loosened and slid back on the frame to permit inspection of the machinery. Drive is by a single heavy chain to the live rear axle. Michelin tires are fitted to the wheels, though solid rubber tires will be used if ordered.

A two-ton truck with an open body, driven by a 30-horsepower, double-opposed, horizontal motor hung under the body, was shown by the Logan Construction Co., of Chillicothe, Ohio, while a 1,500-pound delivery wagon was used as a demonstration vehicle outside. The truck has a water-cooled motor driving through a sliding-gear transmission, countershaft and side chains to the rear wheels; a stationary axle is used. The gearing gives two speeds forward and one reverse. The axles are of I-beam steel. The framing is of heavy angle steel, trussed by a system peculiar to the Logan cars, and is carried on full elliptic springs front and rear; wheels are 32 inches in diameter, and are fitted with 4 1-2-inch solid rubber tires. The wheelbase is 100 inches and the tread 56 1-2 inches. The machine weighs 2,500 pounds, with open box body. Timken roller bearings are fitted to the road wheels.

The smaller machine, used for demonstration, has a capacity of 1,500 pounds, and weighs 1,150 pounds; tread, 56 inches, wheelbase 86 inches; motor, 20-horsepower; maximum speed, 15 miles an hour. Drive is by single chain to a live rear axle. Wheels are 30 inches in diameter, with 3-inch solid rubber tires.

A 3,000-pound gasoline truck with double-opposed cylinder motor was exhibited by the Rapid Motor Vehicle Co., of Detroit, Mich. This machine is fitted with planetary transmission gear, giving two forward speeds and a reverse, the drive, as is usual with motors of this type, being first to a countershaft carrying the differential, and then to the rear wheels by side chains. The motor has cylinders of 5 inches bore and 5 inches stroke. A feature of the car is that manganese bronze is used for both axles, the manufacturers stating that they believe this material particularly well suited to withstanding the constant vibration incident to road work, without crystallization or fatigue. The stubs carrying the front wheels are of the same material, with the steering arms cast integral. Special efforts have been made to secure accessibility of all parts; the motor is disassembled from the top downward, beginning with the top of the crankcase and ending with the bottom. The same feature of accessibility is found throughout the machine. The wheels run on roller bearings.

A striking example of heavy, substantial construction was shown in the Atlas three-ton gasoline truck, in which the engine and transmission are hung on the rear axle. This machine is built by the Knox Motor Truck Co., of Springfield, Mass. The engine has two horizontal cylinders placed parallel to one another, but with considerable open space between them; the engine is in front of the rear axle, with the heads pointing toward the front of the truck. Between the engine and the rear axle is the sliding-gear transmission, so that the engine drives direct to the live rear axle through the gears. An oil-tight casing encloses the entire system. No chains, bevel gears or universal joints are used. A single mechanical oiler, of large size, lubricates the entire system.

Owing to the fact that most of the weight of the machinery is carried by the rear axle

stroke; ignition is by jump spark. The clutch is a leather-faced cone and works into the flywheel, which is mounted close to the frame on the right-hand side of the machine. The transmission gives three forward speeds, and reverse; the gears are very massive, having teeth 2 1-4 inches wide.

The car weighs 6,000 pounds and can be fitted with either solid rubber or steel tires, and with a body of any desired style. With an ordinary platform or open box body, the carrying space is 11 feet 3 inches long and 5 feet wide. The wheelbase is 114 inches and the tread 58 inches; wheels are 36 inches in diameter, and all brakes act on the hubs of the rear wheels.

The Crown delivery wagon, exhibited by the Detroit Auto Vehicle Co., of Detroit, Mich., is driven by a two-cylinder vertical motor, placed under the driver's seat, de-

tubular radiator is placed under the front of the footboard, flush with the dashboard. The gasoline tank holds 12 gallons.

The Pope-Hartford gasoline truck exhibited by the Pope Manufacturing Company has a horizontal double-opposed motor of 20-24 horsepower under the driver's seat; a feature of the car is the magnetic control of the transmission, the current for operating this being supplied by a small engine-driven generator; a controller at the driver's left hand controls the various transmission clutches. The truck has a load capacity of two tons; the wheelbase is 96 inches and the tread, 63 inches.

One of the commercial cars which was shown in operation out of doors in the city streets and was not exhibited in either building was the Matheson five-ton gasoline truck, built by the Matheson Motor Car Company, of Wilkes-Barre, Pa. The car was fitted with a covered platform body and was loaded with five tons of pig iron, a load which was handled with apparent ease. A peculiarity in the arrangement of the truck is that there are two bucket seats, instead of the usual wide single seat, and the hood under which the motor is placed comes between the seats, thus economizing room—an important matter in a commercial machine. The motor is of the regular Matheson type with valves placed side by side and opening directly into the cylinders. The valves are operated by rocker arms carried by brackets on the tops of the cylinders, and the camshaft is placed so that the cams act directly on the outer ends of the rocker arms without the intervention of the long push-rods usually employed with similar valve arrangements. The camshaft is gear-driven by a vertical shaft rising from the end of the crankcase. The engine is controlled by throttling governor.

Friction drive was shown applied to commercial cars by the Buckeye Manufacturing Company, of Anderson, Ind., which exhibited two gasoline trucks, one of 1,500 pounds carrying capacity and the other of 2,000 pounds capacity with the Lambert friction driving gear. The trucks embody the salient features of the pleasure cars, though heavily built; the exhibit was always the center of an interested crowd. A more extended discussion of this drive will be found elsewhere in this issue.

The Mitchell Motor Car Company, of Racine, Wis., showed a closed delivery wagon having a carrying capacity of one ton with a tare of 1,600 pounds. The motive power is supplied by a two-cylinder vertical motor placed with crankshaft fore-and-aft, rated at 12-14 horsepower; drive is through cone clutch, three-speed sliding gear transmission and propeller shaft to the rear axle. The motor is water cooled. Framing is of pressed steel of heavy gauge; wheelbase is 96 inches; tread, 56 inches; wheels are 32 inches in diameter and are fitted with solid rubber tires. This handy machine was shown in operation out of doors.

The Maxwell 1,000 pound delivery wagon



MATHESON FIVE-TON GASOLINE TRUCK WITH FULL LOAD OF PIG IRON.

without the intervention of springs, the axle housing is of exceedingly strong construction, and is greatly strengthened by a system of trussing which, with the axle and casing, forms a rear frame of great strength and considerable elasticity. From the rear axle to the front axle extends a frame of channel steel which is pivotally connected to the front axle. The cylinders are supported near their front ends by brackets attached to the frames, and the tubular radiator rests on the framing forward of the engine. Owing to the wide space between the frame and the body there is a free circulation of air through the radiator.

The engine is rated at 24-horsepower and has cylinders of 6 inches bore and 7 inches

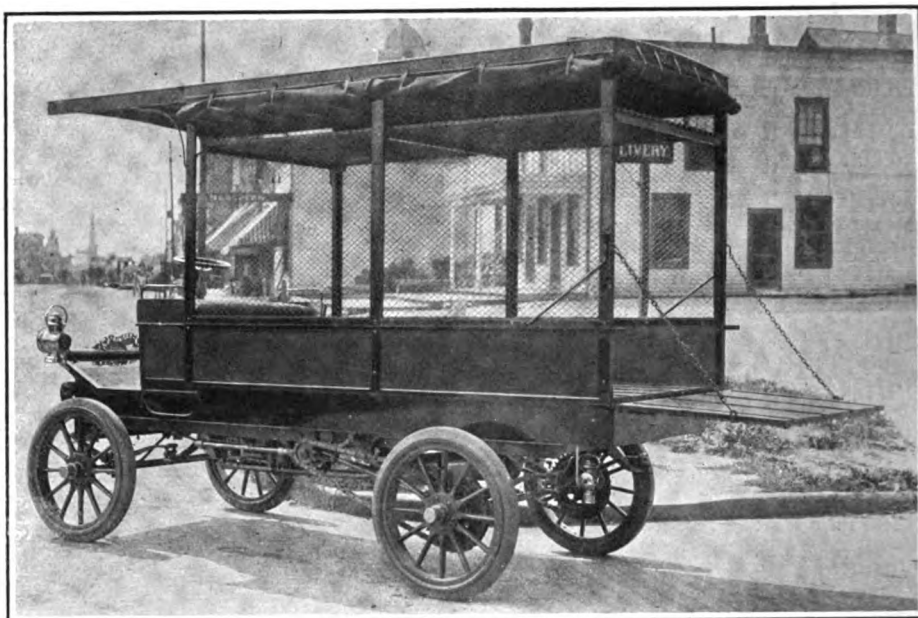
veloping 16-horsepower, and driving through a two-speed planetary transmission and single chain to the live rear axle. The load capacity of the wagon is 1,500 pounds; the loading space in the closed body is 58 inches long, 40 inches wide, and 50 inches high, though as much as twelve inches can be added to the length, on order, if light but bulky loads are to be carried. The maximum speed is 20 miles an hour. The framing is of angle steel; wheels are 30 inches in diameter, with 2 1-2-inch solid rubber tires. Wheelbase, 78 inches; tread, 56 inches. The brakes are on the rear hubs and are of the internal expanding type. Hyatt roller bearings are used on the rear wheels and ball bearings on the front wheels. All springs are full elliptics. A

embodies the main features of the Maxwell pleasure cars, manufactured by the Maxwell Briscoe Motor Company, of Tarrytown, N. Y.; the motor is of the double-opposed cylinder type, developing 16 horsepower, and is placed under the body, driving through multiple disk clutch, three-speed sliding gear transmission and propeller shaft to the rear axle which is, of course, of the live type. The car weighs 1,550 pounds; wheelbase, 87 inches; tread, 56 inches; wheels, 30 inches in diameter, with 3 1-2-inch tires. The frame is of pressed steel. This truck was shown in actual operation in the streets and caused much favorable comment.

A very strongly built three-ton gasoline truck with a 30-horsepower, four-cylinder horizontal engine, was shown by the Commercial Motor Car Company; the machine has a steel frame. One of the features is the construction of the tires. These consist of a series of segments, made of rubber and fabric in alternate layers, each segment being about twelve inches long. The segments are placed so as to "break joints" and five segments are placed side by side. The engine is placed in front and drives through an Adams transmission, jackshaft and double chains to the rear wheels. The Adams transmission is operated by a sliding key, working in a splined shaft and engaging with slots cut in the hubs of the gears. The key is moved by a lever beside the driver, and the transmission gives two forward speeds and a reverse.

ELECTRICS.

In electrical commercial cars there are comparatively few broadly distinguishing features, the opportunities for individuality being far more limited than in the gasoline cars; besides, the electric machines are, to a great extent, standardized and are much more familiar to the public than the gasoline cars, which are, except in a few cases, comparatively new arrivals in the field. Most of the exhibitors of electric wagons have been building these machines for some time; but the Studebaker Company, though its carriages and wagons are known around the world and its electric and gasoline pleasure cars have already made a name for themselves, is a comparatively new exhibitor in the commercial vehicle field. Five machines were exhibited, the largest a five-ton truck and the smallest a 1,000-pound delivery; between these came a 3 1-2-ton truck, a 2-ton truck and a 2,500-pound wagon. All the Studebaker commercial cars embody the same general features. The cars are all equipped with Exide batteries supplying current for two motors, each motor driving one of the rear wheels independently of the other. This arrangement obviates the necessity for a differential; the rear axle is stationary, a solid steel forging. Both battery and motors are suspended from the frame, thus getting the benefit of the cushioning effect of the springs—a feature which, the manufacturers state, adds greatly to the useful life of both.



RAPID 3,000-POUND DELIVERY WAGON WITH DOUBLE OPPOSED GASOLINE MOTOR.

The Pope Motor Car Company, of Indianapolis, Ind., exhibited four Waverley electric machines. The heaviest was a 3-ton truck of a type much used by large milling concerns. The whole body is covered by a standing top, while the rear portion has standing sides. Curtains are supplied, so that the entire car can be enclosed. Two motors drive to the rear wheels through a countershaft and heavy side chains; the battery consists of 42 cells. Wheels are of wood, 36 inches in diameter, with 5-inch solid rubber tires. The loading space is 13 feet long, 4 feet 6 inches wide and 6 feet high. The wheelbase is 112 inches and the tread 76 inches. A one-ton truck shown embodies the same general features on a smaller scale, though the body is a plain platform with a carrying space 10 feet long and 6 feet wide. The wheelbase is 96 inches and the tread 62 inches. A closed delivery wagon has a carrying capacity of 1,200 pounds and a carrying space 5 feet 2 inches long, 3 feet 4 inches wide and 4 feet 8 inches high; a single motor, suspended from the body, drives through double reduction gears and side chains to the rear wheels. The Waverley open delivery wagon, the lightest machine shown at this stand, has a carrying capacity of 800 pounds with an open body 5 feet 3 inches long and 3 feet wide behind the driver's seat. Two motors drive the rear wheels through spur gearing. Wheelbase, 80 inches; tread, 54 inches. The wheels are 30 inches in diameter and are fitted with pneumatic tires, 4 inches in the rear and 3 1-2 inches in front. The Waverley cars are fitted with either Exide or National batteries. All the cars shown except the 800-pound delivery wagon have 42 cell batteries; the light machine carries 30 cells.

A 14-passenger electric omnibus was shown by the Auto-Car Equipment Company, of Buffalo, N. Y. This machine has an oak frame armored with steel fitch-

plates, with a reachless running gear and a three-point suspension system. Two Westinghouse motors of 7 1-2 horsepower each drive the rear wheels through heavy chains. The battery consists of 44 cells of 13 M. V. Exide; the machine has a maximum speed of 15 miles an hour under load. The total weight is 5,600 pounds. The interior is arranged in the usual omnibus style, with seats, 18 inches wide, along each side. The three large plate-glass windows on each side can be dropped into pockets out of the way; there is a window in the door, one just back of the driver's seat and one at each end of each side seat. Wheels are 36 inches in diameter with solid rubber wire-mesh Diamond tires, 4 inches in the rear and 3 1-2 inches in front. Axles are of hand-forged steel, 2 inches square. Roller bearings are used throughout the machine. Electric lamps are fitted inside and outside.

The electric delivery wagon exhibited by the Lansden Company, of Newark, N. J., is fitted with an armored wood frame carrying the entire power equipment. The single motor, hung near the front of the frame, drives by chain to a countershaft carrying a differential, and the countershaft drives to the rear wheels by sprockets and chains, the rear axle being of the solid stationary type. The underslung battery compartment is arranged to take any battery that may be specified by the purchaser, and a special charging box with switch is attached to the car within easy reach of the operator. All parts are interchangeable. The springs are all semi-elliptic.

An express wagon with a carrying capacity of 4,000 pounds was shown by the Mc-Crea Motor Truck Company, of Cleveland, O. A wagon of this type is used by the United States Naval Academy at Annapolis, Md., for hauling supplies. The battery is hung under the body in the conventional way and the motors drive the rear wheels by side chains. The speed is about 8 miles

an hour under load and the working radius is 40 miles on a single charge. Different bodies can be fitted to the same chassis for different classes of work.

A light closed-body delivery wagon exhibited by the Pittsburg Motor Vehicle Company, of Pittsburg, Pa., has a maximum carrying capacity of 1,000 pounds and is driven by a single motor with single-chain drive to a sprocket carried on the differential casing on the right-hand side, close to the wheel. The differential drives one wheel through a tubular sleeve and the other through a solid axle, so that a divided rear axle is avoided, but the simplicity of a single-chain drive is retained. The battery consists of 24 Exide cells and gives the car a mileage of about 35 with a maximum speed of 11 miles an hour.

Four vehicles are shown by the Electric Vehicle Company, of Hartford, Conn., manufacturers of the well-known Columbia electric cars. The machines shown range in carrying capacity from 1,000 pounds to three

tons. The heavy truck is equipped with two independent motors driving the rear wheels through spur reduction gears and side chains. The frame is of I-beam iron; wheelbase, 113 inches; wheels are 36 inches in diameter with 5-inch solid rubber tires. The speed is 8 miles an hour and the radius of action 30 miles on a charge. The Columbia 2,000-pound express wagon embodies the same mechanical features as the larger car and is adapted to receive any style of body. Wheels are 36 inches in diameter with 3 1/2-inch solid tires; the speed is 11 miles an hour and the radius of action 35 miles, with full load. A 1,000-pound delivery wagon was on view with two motors and direct gear drive to the rear wheels. All the Columbia cars have Exide batteries carried in trays and fitted with automatic contacts to facilitate removal and replacement. The largest machines have 44 cells; those of less than 3 tons' capacity have 42 cells.

A five-ton truck with electric windlass at-

tached was the largest of the six machines exhibited by the Vehicle Equipment Company, of Brooklyn, N. Y. These cars have pedestal guides in which the axles rise and fall without lateral motion—an arrangement which has always been standard in railroad work and seems to answer equally well for heavy trucking. Two motors are used; these are suspended from the side frames and drive the rear wheels through spur gears bolted to the hubs. The V. E. Company follows the usual practice of manufacturers of electric commercial vehicles in using the same general features in machines of all sizes. A three-ton brewery truck, a two-ton truck and three delivery wagons of 1,000 pounds, 2,000 pounds and 3,000 pounds capacity respectively, embody the standard V. E. features of construction.

Considerable difficulty was experienced in obtaining details regarding some of the vehicles, and a few exhibits seemed practically deserted, repeated visits having been made without finding an attendant in charge.

GREAT DISPLAY OF SUNDRIES AT THE SHOWS.

THE holding of the New York show this year in two of the largest of New York's public buildings gave opportunity for a display of parts and accessories that not only exceeded any previous exhibition but gave an adequate idea to the visitor of the magnitude of the sundries industry. The immense variety of parts, fittings, supplies, and accessories indicated the vast total of capital invested in the plants engaged in the production of articles brought into existence solely by the advent of the automobile.

Notwithstanding their comparatively small size, nearly as many actual square feet of floor space were required for the exhibition of sundries as for the complete cars themselves, while the number of exhibitors was much in excess of the number of car makers. In the Garden show the parts and sundries makers monopolized not only the first and second balconies and the first and second tier boxes, but also the concert hall

and were to be found in the basement. At the Armory the gallery all around the vast drill hall was completely occupied by the accessories exhibits, which overflowed this space and were located in the basement and in a number of the company rooms.

Developments in the sundries lines are of almost as much interest to the car owner as the tendencies in automobile construction, so that it is in no wise surprising that the galleries were well filled each day and night of the shows by visitors, who looked eagerly for novelties. They were not disappointed in the quest, for the shows of 1906 were prolific in new things and marked interesting departures from the drift revealed at previous shows.

Never before have automobile tops made such a showing as this year; upwards of a dozen concerns made displays of tops alone. These were almost without exception of the four-bow extension or folding form, thus marking an advance beyond the Cape

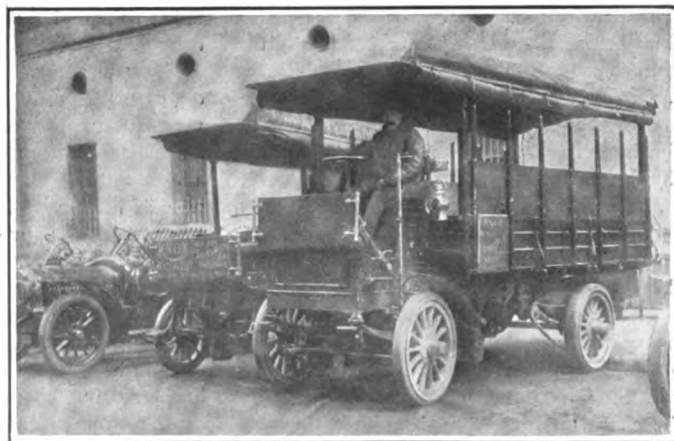
Cart style of hood that was popular a year ago. The coverings are most commonly of mackintosh cloth and pantasote, while the storm aprons and curtains are generously lighted by large sheets of celluloid, which is light, transparent and can be rolled up with the curtains without cracking.

For the first time shock absorbers made their appearance in number at the show. At least ten different makes were displayed, most of them so recently put in the market that only samples could be shown. Some of these were sectioned to show the internal construction. At most of the stands practical demonstrations of their operation were made by means of a section of car frame with spring attached and the absorber interposed.

Another interesting development in the accessories display was the advent of the prominent high-grade steel manufacturing concerns into the trade with special grades of chrome nickel steels and phosphor and



MACK GASOLINE TRUCK WITH MOTOR UNDER HOOD.



KNOX AIR-COOLED GASOLINE 16-20-H.P. TRUCK.

manganese bronze for axles, gears, crankshafts, crank cases and gear cases, and similar parts where great strength, toughness and light weight are important considerations.

Anti-skid tire treads and tire attachments were in greater variety than ever before, the metal studded leather tread vulcanized onto the regular pneumatic tire having made great advances in popularity.

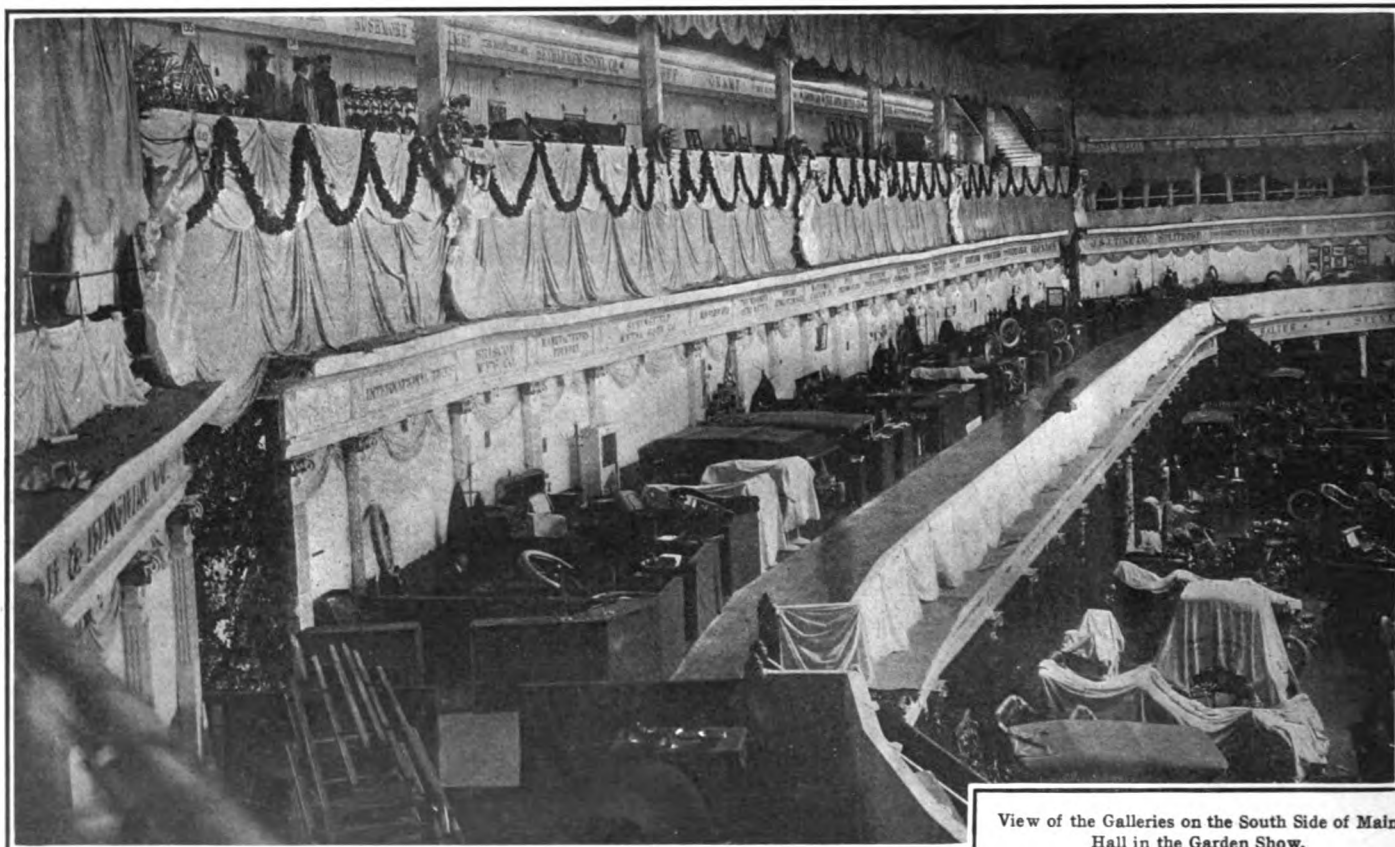
Improvements in mechanical lubricators and ignition apparatus have made good progress during the year, as revealed by the additions to the numerous makes of oilers, spark coils, spark plugs and igniters.

Alarm signals sounded by exhaust gas from the engine have multiplied since the original one was exhibited at the Garden

devices for gasoline engines was shown by this concern. It is called the Ever Ready starter, and consists of a heavy band spring with suitable releasing mechanism all housed in a case mounted at the front end of the engine crankshaft. A handle for cranking is provided for an initial winding of the spring, although once the engine is started it is depended upon to rewind the spring automatically. It was asserted that the spring when fully wound has sufficient strength for turning over an engine of 20 to 40 horsepower. Another novelty by the same company was the Ever Ready trip detector, a neat and well-made device in the form of a circular wood case with plate glass cover to be locked on the dash. Inside the case is a brass disk with milled edge which carries a

of oil in the tank at all times. Ever Ready dry cells for ignition batteries were also on exhibition.

AUTO ACCESSORIES Co.—An exhibit of varied character was made, the most prominent object being an extension automobile top for a side-entrance touring car, covered with black pantasote and fitted with storm apron, side curtains and rear curtain. All the curtains had large celluloid lights, providing illumination of the interior from all sides of the car. There were three lights on the side curtains—an almost general practice this year with all top makers—the central one in this make being oval and the end ones triangular. Another prominent feature of the display was a rack filled with a variety of waterproof automobile coats in khaki,



View of the Galleries on the South Side of Main Hall in the Garden Show.

show a year ago, the popularity of the chime signal not having escaped the attention of manufacturers with an eye open for their business interests. Simultaneously the siren has come into prominence, several makes of these signals adapted to be operated by contact of a pulley with the engine flywheel having been put in the market during the past season.

An innovation at the New York shows of 1906 was the subscription booths of the automobile press at both the Garden and the Armory.

In the following columns are briefly mentioned the lines of goods displayed by each maker or dealer in parts or sundries, with the novelties especially emphasized and the characteristics of each pointed out.

AMERICAN ELECTRIC NOVELTY & MFG. Co.—One of the very few automatic starting

cardboard dial graduated by miles. An arm with a pencil point is in contact with the face of the dial and a dog engages the milled edge of the disk one notch at a time. This dog is attached to a spring that carries at its outer arm a weight that vibrates vertically when the car is running on the road. Suitable locks are provided for stopping the action and for opening the case. The purpose of the device is to enable the owner of a car to know approximately how much the car has been run in any given time, placing a check on the unauthorized use of the machine by a chauffeur or any other person. Among other articles shown was a gasoline filler to be permanently inserted in the gasoline tank and having a telescoping tube cut away on one side so as to catch any splash from the gasoline can when pouring. It also had an indicator dial to show the amount

cravenette, mackintosh, gossamer and other materials for both men and women. A new garment in this line for the coming season is a raincoat made with double front, buttoning first far over on the left side, then lapping over and buttoning down the right side. This gives double protection on the breast and knees when driving into a heavy rain. Several Sterling gas head lamps made by this company were shown, and as a novelty the company displayed an automatic turning bracket to be socketed on the front spring horns and connected with the steering mechanism so that the light of the lamps will always be thrown in the direction the wheels of the car are pointed.

AUTOMOBILE COVER & TOP MFG. Co.—A most attractive exhibit was a rich wine colored extension top shown on a lemon yellow and black striped Pope-Hartford body. The

covering of the top was a very fine texture imported mackintosh waterproof cloth, while the bows and joints were covered with red leather; sockets and buttons were polished brass. An interesting feature was red leather cover slips for protecting the roll of the upholstery over the edges of the body. A more serviceable top on similar lines to the foregoing, but covered with a gray mackintosh that would not show dust and rain spots, was also shown. The bows were of hickory in the natural finish. As Eastern distributing agents for the manufacturers, the company displayed Gabriel horns in different sizes and styles, supplemental spiral springs for use at the ends of the rear spring horns, and a compact wine cabinet, with ice compartment, to be carried in the car.

sizes for garage or shop use and for carrying on machines.

AURORA AUTOMATIC MACHINERY Co.—The line of Thor fittings for automobiles and motorcycles was displayed. Also on view, motors complete and in parts, pneumatic tools, such as air drills, wood-boring machines, hammers, etc. The installation of complete air plants is a specialty of the exhibitor, and everything that enters into the composition of such a plant was shown in sample.

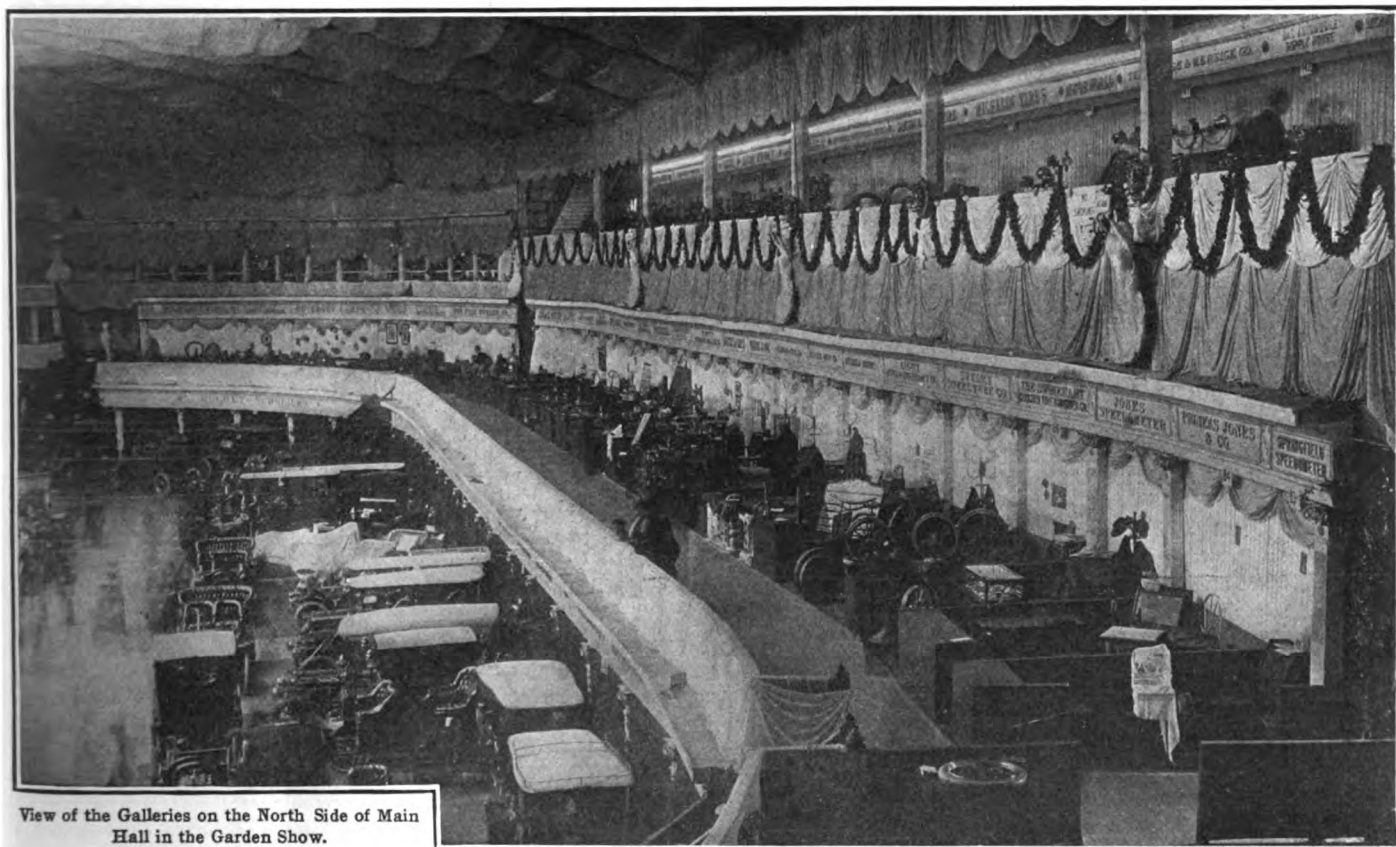
ASTER Co., AMERICAN BRANCH.—Three models of the well-known French Aster four-cylinder motors were shown—20-horsepower, 22-horsepower and 30-35-horsepower. Cylinders are cast in pairs and valves are mechanically operated; in the smaller Aster

tacle by the engine. Great economy and a perfect mixture are claimed by the manufacturers.

AMERICAN BALL BEARING Co.—Several specimens of axles and other parts of well-known cars, fitted with roller bearings made by this company, were shown, also separate bearings of different sizes and for various uses.

AUTO BRASS & ALUMINUM Co.—Two new power-driven mechanical oilers were shown at this stand, also tank fillers, babbitt-lined bushings, foot pedal plates, a safety cranking device and tonneau door handle.

AUTO-SUPPLY Co.—Two wax figures in automobile costumes effectively staged lent a distinguishing character to the exhibit, which consisted of a complete supply of



View of the Galleries on the North Side of Main Hall in the Garden Show.

ATWOOD MFG. Co.—A big display of the Atwood lamps with the latest features in appurtenances made an attractive exhibit. The new Atwood generator was shown, its leading characteristic being simplicity. The ease with which the carbide basket can be loaded and unloaded is a point dwelt strongly upon by the makers. The carbide is kept cool with water jacket about the generator, and the residue after consumption is in the form of dust instead of paste. The new models in lamps consist of a diamond-shaped oil lamp styled "No. 31," and two diamond backed gas lamps of distinctive and unique construction, designated as Nos. 9 and 12 in the catalogue.

ADAM COOK'S SONS.—Here was shown a complete line of the well-known Albany grease, in all the consistencies required for automobile use, put up in cans of various

motors the valves are all on the same side, while the larger motors have valves on opposite sides of the cylinders. Two chassis, without motors, were also shown, as well as a number of steering gears and other parts.

AUTO COIL COMPANY.—This concern has introduced a radical change in its coils this season by adopting hard rubber for units instead of wood. A large display of coils, single and multiple, was on view.

ATWATER KENT MFG. WORKS.—New spark generators and timers were shown, also a new ammeter. The spark generator has mechanical vibrator and no timer. Small battery consumption is claimed.

AMERICAN GENERATOR Co.—This exhibit consists of a carbureting device in which gasoline is stored by an absorbent agent and the gas drawn from the tank or recep-

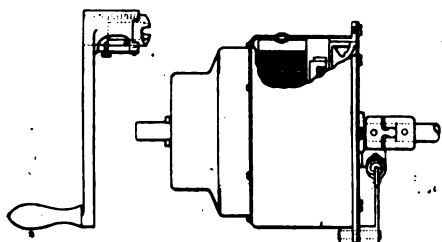
everything for the autoist's use, as the name of the company indicates. The house announces that its new sixth annual catalogue, now in press, will be larger and more complete than any of its predecessors.

AUTO IMPROVEMENT Co.—A display of the "Ever Ready" line of automobile utilities, including dry-cell batteries, pocket ammeters and flashlights, electric bulb lamps, gasoline filler and trip detector, the latter described as "a silent little sentinel which faithfully watches over your car when you are absent," and which mechanically records its every authorized and unauthorized movement. The real feature of this exhibit was the "Ever Ready Starter," a spring device designed to start a car by simply tripping a small pedal release lever located within convenient reach of the operator's foot. The running of the engine automati-

cally rewinds the spring. The whole operation was shown by means of a working model mounted on a frame.

AUTO-LOCK-PLUG Co.—Without electric current the modern gasoline car cannot be operated, and if the supply of electricity is interrupted in such a way that it cannot be re-established except by the owner of the car the danger of theft or unauthorized use of the machine is much reduced. This concern makes a lock switch which can only be turned by its own key; the lock is a Yale, and no two can be opened by the same key. There are no exposed points on the switch which would enable connections to be made outside. Three keys are provided with each switch.

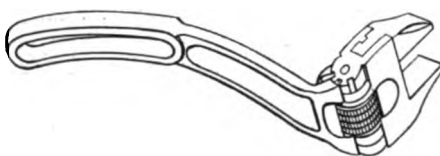
BYRNE, KINGSTON & Co.—An extensive exhibit of Kingston carbureters and mufflers of all sizes, from the largest automobile size to the smallest, suitable for motorcycles, also ignition apparatus—coils, spark plugs and timers—steering wheels and circulating pumps for water and oil. Two types of carbureter are now manufactured, one having a plain float in a chamber at one side of the



EVER-READY AUTOMATIC STARTER.

spray chamber, and the other having a float surrounding the spray nozzle, so that the carbureter is not affected by changes in the road level. Three new carbureters are added to the Kingston line this season—Type K, Type KC, and automatic Type D. A dash coil with single adjusting screw made its initial appearance at the show in connection with the new carbureters, and also a new timer of the roller contact type. In addition to the above the Kingston mufflers and steering wheels were shown.

S. F. Bowser & Co.—In addition to a variety of oil and gasoline tanks, self-measuring pumps, cabinets and other apparatus for handling lubricating and fuel oils, the Bowser company showed a distinct



ELLIS ADJUSTABLE S WRENCH.

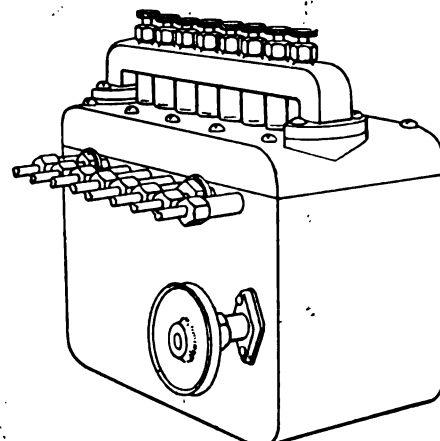
novelty. This is a portable tank, mounted on wheels and carrying its own self-measuring pump. The tank holds 65 gallons and is mounted on two heavy wire wheels; a handle at each end, folding out of the way when not wanted, provides means for pushing the tank about. The pump, self-measuring and adjustable, is on top of the tank and is similar to the regular Bowser pump. A novel detail is that as gasoline is pumped, through a hose and a tight nozzle, into the tank of a car, the vapor-saturated air in the car tank is forced through another hose into the portable tank, so that there is no escape of inflammable gas into the room. The same gas transfer plan works when the portable tank is being filled from the main tank, so that gas is always kept where it can do no harm. The nozzles have valves in their ends, preventing any dripping. The filler is an air-tight fit and is covered by a brass dome on a hinge; the dome may be locked down and the pump also can be locked. A sales record machine is attached to the top of the tank, so that as gasoline is supplied to a car, for instance, a check is given to the chauffeur, one remains in the machine for record and a third is placed in a special receptacle on the side of the tank for the use of the garage. A gasoline gage is also fitted.

BOEHM & LEVINE.—This was an exhibit to appeal to automobilists of the fair sex, and contained things that can only be described by a woman. A sort of combination hood, veil and scarf was shown, under the name of "Mon Bijou," which looked as if it might be an extremely useful affair. Pulling a string transforms it from a scarf to a hood with veil attached; pulling the buttons changes it back to a scarf.

JOHN BOYLE & Co.—Automobile touring has become so popular that this concern has manufactured a line of trunks especially for automobile use; a special style of trunk is made for each one of a number of differ-

ent makes of car, so that the trunk can be strapped on without trouble. A number of these trunks, as well as other leather goods, lunch baskets and the like, formed an exhibit that was particularly attractive to automobilists who delight in touring. Tags, numbers, tire cases, tool rolls and tools were also shown.

BADGER BRASS MFG. Co.—Among the new goods shown was a generator for gas lamps made in circular form, each section in one piece of drawn brass and seamless. Three sizes of the round models were shown. The shells were of heavy gauge and soldered seams were avoided. With the new system of gas generation used the water in the tank saturates a wick in the tube, and when a valve is turned on, this drops into a screen tube, and, passing out of the holes at the bottom, comes into contact with the carbide in the cage and forms the gas which passes out at the top of the

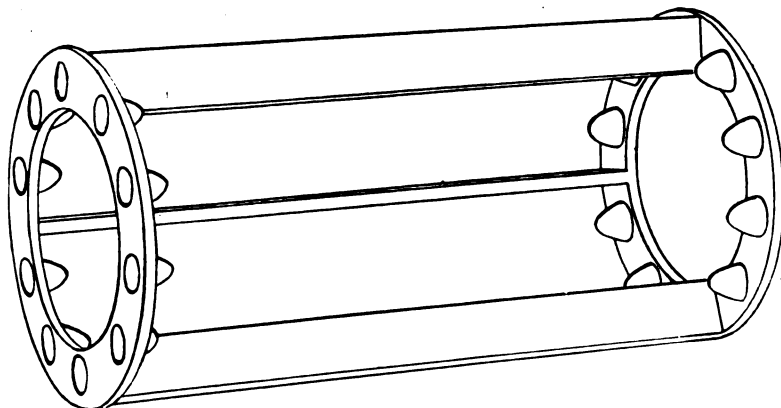


AUTO B. & A. CO. SIGHT-SPEED POWER-DRIVEN MECHANICAL OILIER.

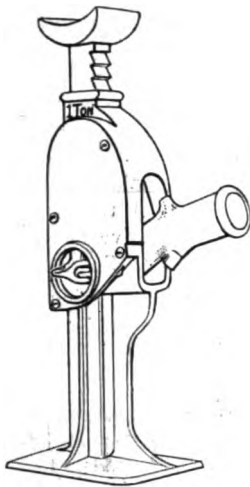
generator. The unused carbide held in the cage is separated by the screen in the bottom, and the used material falls to the bottom of the cage in the form of dry powder. The display of solar lamps was a fine one, over twenty-five varieties being shown in all the marketable sizes.

BALDWIN CHAIN & MFG. Co.—Sprocket chains of all sizes were exhibited here, supplemented this year by the Baldwin Spring Recoil Check, an automatic frictional device which, attached to the body and axle of a car, controls the recoil of the springs. The Monitor speed recorder was also in operation here, the speed of an electric-motor-driven anemometer being recorded on a card in plain view of the spectator. One new size of chain was shown, of one-inch pitch and five-eighths inch wide. The Baldwin company will act as selling agent for the Monitor speed recorder.

BROWN & LIPE GEAR Co.—Samples of equalizing and steering gears were shown. The company claims the honor of being the originators of the spur gear type of differential gearing as applied to automobiles, and for many years has made gear-driven mechanisms exclusively. Nine mod-



IMPROVED HYATT ROLLER BEARING RETAINER—WITHOUT ROLLERS.



BARRETT SINGLE-ACTING JACK.

els of equalizing gears and two models of steering gear were displayed.

BRISCOE MFG. Co.—Radiators, radiator coils, fans, hoods, fenders and tanks constituted the exhibit of this concern. The radiators were shown in sizes and shapes to correspond with the lines of the better-known American cars.

BRENNAN MOTOR MFG. Co.—Complete motors ready for delivery to the trade is the specialty of this house, which exhibited its new four-cylinder vertical engine with mechanically operated valves. A new crankcase compression oiler and new carbureter with hot air strainer are among this year's improvements. All sizes from 18 to 80 horsepower are made for autos or for marine use.

E. M. BENFORD.—Lipman electrical speed indicators and Lipman pumps were shown, also the Auto Plex batteries and Peerless perpetual spark plugs.

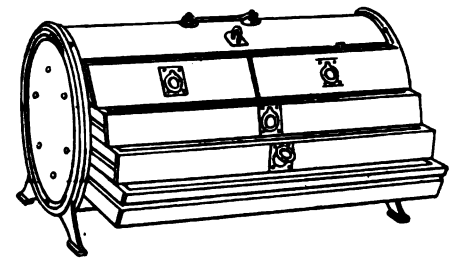
BARNES GEAR Co.—The adjustable steering gear made by this house, and upon which letters patent were recently issued, was the feature of the exhibit. The nut and screw principle is used, but an adjusting lever is applied to take up the wear.

WILLIAM HIRAM BROWN.—The main feature of this exhibit was the Brown motor car dust guards, which were shown attached to a tonneau. These guards are so placed

as to detract in no way from the appearance of a car, and, besides, do not interfere with the view. They can be put in position or removed in ten minutes' time. Another feature of the exhibit was the Elephant tread tire, which is claimed to be non-skidding and more resilient than a solid.

BETHLEHEM STEEL Co.—Drop forgings in every style, also a considerable display of flange steel parts.

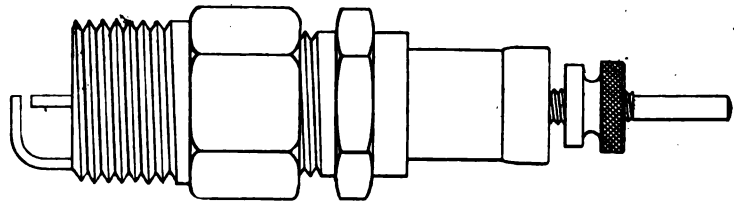
CARPENTER STEEL Co.—Eight great steel war projectiles, several of which measured twelve inches in diameter, drew attention in the basement of the Garden to an exhibit of special steels suitable for automobile construction. The Carpenter company, which is one of the large manufacturers of war material for the government, arranged its exhibit with the idea that the display of projectiles would be a convincing proof of its ability to provide special steels of great tensile strength for axles, shafts, gears and similar automobile parts. One of the projectiles shown bore a placard announcing that it had passed through eighteen inches of hardened armor plate; it bore no visible evidences of such a severe test. The exhibit



20TH CENTURY TOOL BOX.

batteries were also shown, while the whole stand was illuminated by the well-known greenish light of the Cooper Hewitt mercury vapor lamps. All the charging outfits employ the mercury vapor bulbs for converting the alternating current used for street lighting into direct current for recharging batteries.

WM. CRAMP & SONS SHIP & ENGINE BUILDING Co.—Particularly interesting to manufacturers and technical men was the Cramp exhibit of special castings of bronze, including crankcases, wheels, small parts and an I-beam front axle, the latter a fine piece of work. The company states that



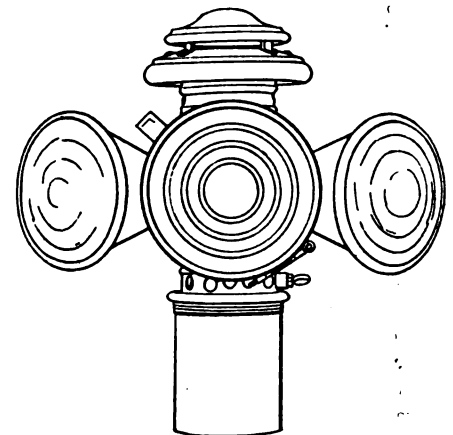
DUPLEX SPARK PLUG, WHICH FIRES WHEN SOOTED.

of steels included billets in the rough, crankshaft blocks in the solid and in different stages of cutting out to shape and machining; various small automobile parts drop forged from Carpenter steels by one of the company's customers who loaned the parts, axles drop forged by the Carpenter company upon special order after blueprints furnished by customers, various pieces of metal and auto parts bent and twisted under enormous tensile and torsional tests. Several grades of chrome nickel steel and milder nickel steel are made by the company for gears, crankshafts, axles, etc. The finest grades have shown a tensile strength under tests of as much as 275,000 pounds per square inch when tempered, while a four-throw crankshaft for a 40-horsepower engine was distorted only about four inches at the center under a load of sixty tons applied at the middle.

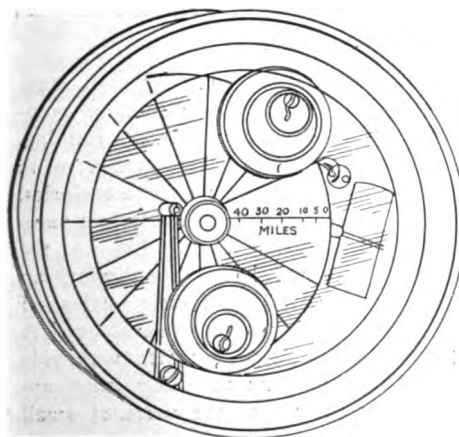
COOPER HEWITT ELECTRIC Co.—The mercury vapor charging outfits recently illustrated and described at length in *THE AUTOMOBILE* were exhibited in several sizes. The largest was a panel for charging ten Baker electric carriages simultaneously, being one of a number of such panels recently ordered by the Cook & Stoddard Co., of Washington, D. C. Two standard thirty-ampere charging outfits for charging batteries of from twelve to forty cells and one small five-ampere outfit for charging small ignition

an important advantage of bronze castings is that they do not warp or twist, but come from the foundry true to the patterns. Bearings are a specialty of this concern, which has had wide experience in the heaviest class of bearing work.

C. COWLES & Co.—L. C. Cowles, vice-president of this concern, demonstrates a unique novelty in the form of an electric annunciator designed especially for automobile use. It has a circular dial (usually fastened to the dash) covered with a face of red glass, upon which are eight divisions



SOLAR (SELF-CONTAINED GAS GENERATOR) LAUNCH HEADLIGHT.



EVER-READY TRIP DETECTOR.

indicating briefly eight driving directions to the chauffeur. By pressing one of the eight buttons inside the limousine a small incandescent lamp lights up the corresponding section on the dial, the others remaining dark. The necessary current is obtained from the ignition battery.

ALBERT CHAMPION Co.—French imported ignition apparatus was shown by this Boston house, many being novelties. There were Nieuport coils and a new Nieuport magneto, that can be run under water, so tight is its brass case. Nieuport plugs and a line of

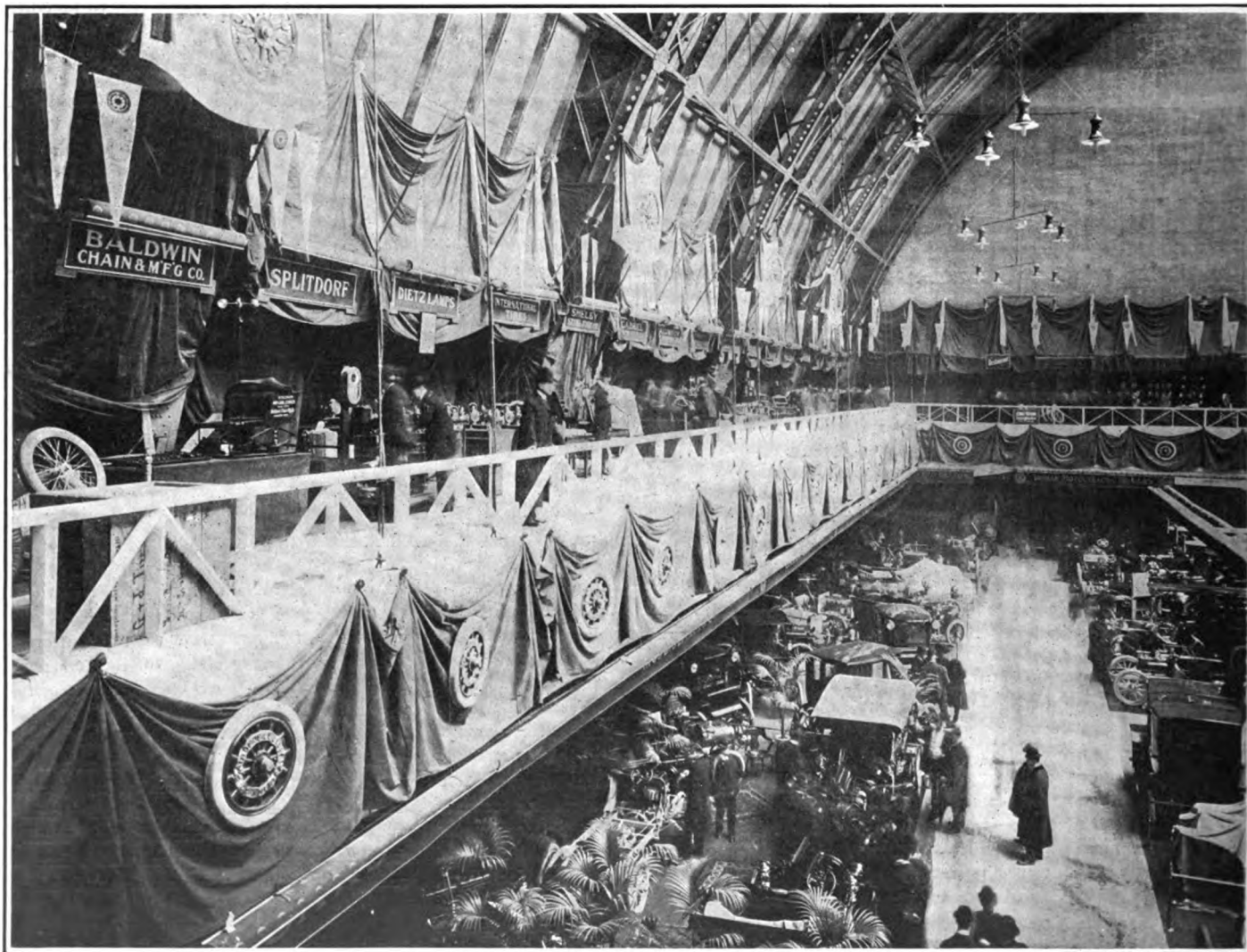
tion system in cold weather, the solutions being non-freezing down to any desired temperature; the "Kalkrystal" solutions, as they are called, can be supplied in strengths that will remain fluid at 18 degrees below zero. They are put up in cans of convenient sizes.

CONSOLIDATED MFG. Co.—The 1906 model of the Yale-California motorcycle was on exhibition at this stand. Many adherents of two-wheeled automobiling congregated around it, and the consensus of opinion seemed to be that the new Y.-C. shows a

specialties shown were the Connecticut coils, meters and switches.

DAC SUPPLY HOUSE.—A comprehensive line of automobile accessories, such as lamps, horns, tools, tire vulcanizers and batteries, was on exhibition. Fully one-half the space was taken up with a display of Gaulois (French) tires, for which this house has the exclusive agency.

DETROIT MOTOR CAR SUPPLY Co.—A large exhibit of automobile clothing for all weathers, automobile accessories and supplies, was made. Particularly seasonable



VIEW OF GALLERY ON SOUTH SIDE OF THE 69TH REGT. ARMORY SHOWING EXHIBITS OF ACCESSORIES.

French insulated cables in all sizes were also featured.

COOK'S RAILWAY APPLIANCE Co.—The jacks shown by this company may be considered among the real necessities of automobiling. The standard jacks, weighing 8 1-2 pounds, have a lifting capacity of one ton each, and the manufacturers state that accidental dropping of the load is impossible. The turning of a cam at one side reverses the movement, so that the load can be lowered by the same pumping motion that raises it.

CARBONDALE CHEMICAL Co.—The exhibit comprised solutions for use in the circula-

marked advance over the 1905 machine.

COLUMBIA LUBRICANTS Co.—Monogram oils and greases were shown in all varieties at this stand. The line includes heavy, medium and light oils, and a variety of greases for gears and joints.

CONNECTICUT TELEPHONE & ELECTRIC Co.—This concern exhibited the Connecticut coil current indicator, a special form of indicating meter attached to which is a double conducting cord and metallic circuit plug; with this indicator it is possible to see at any time just how much current is being drawn from the battery, and, if excessive, to reduce it and thus lengthen its life. Other

were the robes and weatherproof coats shown. This concern manufactures automobile bodies, tops, tire cases, clothing, caps, storm aprons, dash clocks, wind screens and other automobile accessories. The company claims to be the largest manufacturer of automobile bodies in the United States, and had in the Armory an exhibit of several up-to-date styles of coupé, landaulet and limousine bodies. A special runabout top, complete with side curtains, storm front and body irons, appealed particularly to the users of small cars.

DIAMOND CHAIN & MFG. Co.—Diamond

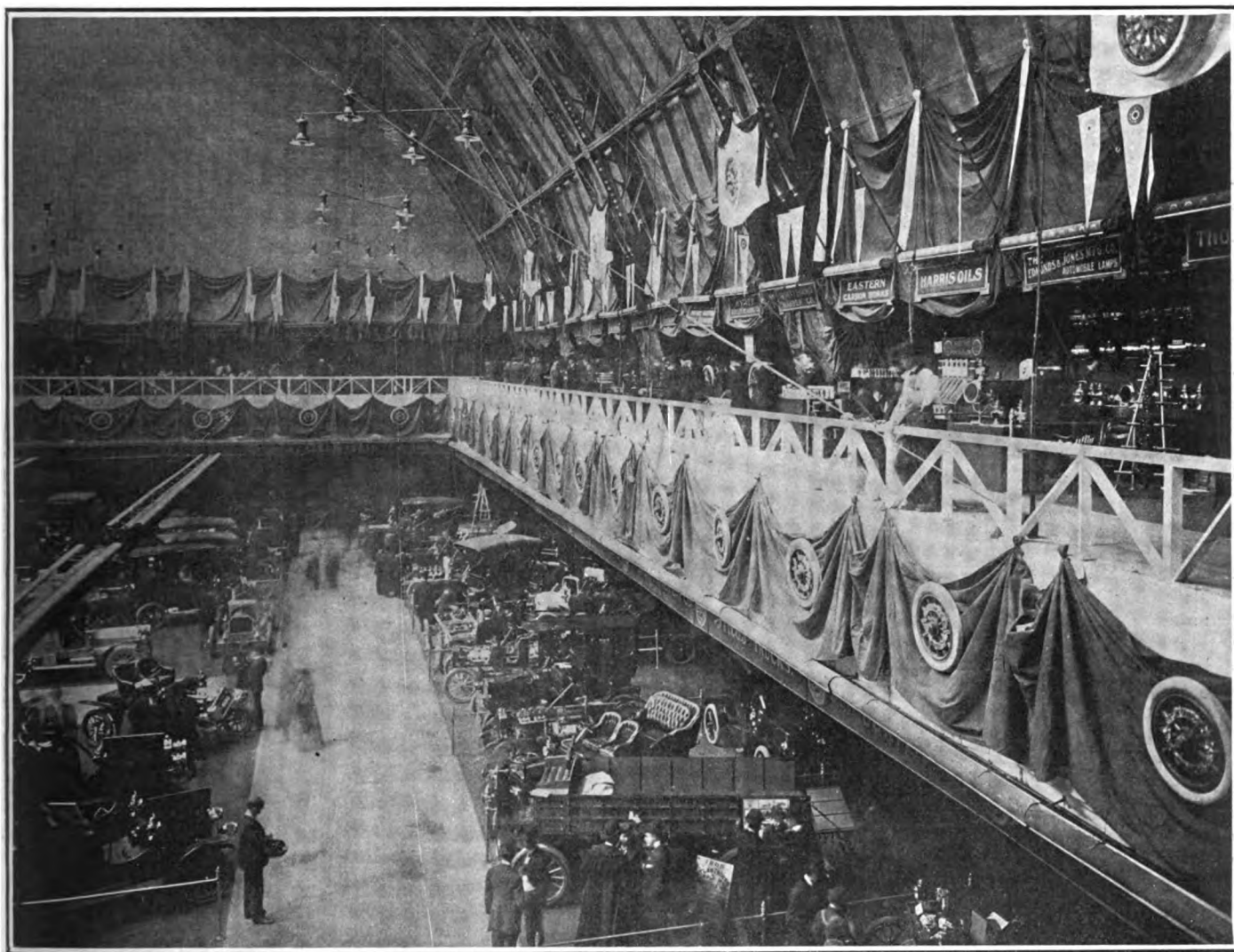
automobile and auto boat chains and various forms and sizes of steel sprocket stud chains and brass boat chains were displayed. The special sprocket chains were highly finished, of great tensile strength, and had the rivets spun smooth.

R. E. DIETZ Co.—A new lamp, the Peerless W, with window in the side, a dainty side lamp for runabouts, and a new generator, are the features of 1906 additions and improvements to the Dietz line. The new gas generator is called the Acetyvone. It uses a compound moulded into sticks of a

is a battery charger, a dynamo of the Apple type, completely inclosed. In size it is a little larger than the old Apple igniter and gives its output of current at a much slower rate, giving a 3-ampere charging rate on an 8-volt battery at 1,400 revolutions per minute. The charger is fitted with a two-inch bevel friction governor. A cut-out switch and volt meter for use with the battery charger was also shown. A new four U timer for distributing secondary current for sparking four cylinders with one coil was shown by a working model. There

shields, tire irons and upholstery materials in general. The Duane tops are used, among others, on White, Locomobile, Lozier, Franklin, Rochet-Schneider and Pope-Toledo cars.

DUPLEX IGNITION Co.—The Duplex spark plug exhibited is an interesting device for getting a spark when the sparking points have become sooted or fouled. The novel feature of the plug is that a brass tube inside the porcelain insulation forms, with the main shell of the plug outside of the insulation, a small condenser which is not



VIEW OF GALLERY ON NORTH SIDE OF THE 69TH REGT. ARMORY SHOWING EXHIBITS OF ACCESSORIES.

suitable form and size to fit a tube in the generator, and only that determined surface which is automatically placed in contact with the water generates the gas. This allows the generation of gas to take place gradually and in direct proportion to the consumption, an accumulation of gas being thereby avoided. All the Dietz lamps are fitted with removable reflectors, and all side lamps with combination brackets. Samples of the barrel type of headlight were prominently displayed.

DAYTON ELECTRICAL MFG. Co.—Several new specialties made their appearance at the exhibit of this well-known house. One

were also new lead bottle storage batteries that can be turned in any position without danger of spilling the liquid electrolyte which is used. A bounteous display of Apple dynamos was made.

DUFF MFG. Co.—One new single-acting jack had been added to the Barrett line of jacks which was exhibited. These jacks are of the quick-acting, automatic lowering type, and can be safely applied without having the passengers alight from a car.

W. J. DUANE & Co.—The automobile tops and limousine bodies of this concern made a very attractive exhibit, the display being completed with a line of slip covers, wind

in the circuit under ordinary conditions. If, however, the plug becomes fouled and refuses to spark, a small switch handle projecting from the top of the plug is pulled up. This breaks the direct current through the central wire and brings the condenser into the circuit; the condenser rapidly becomes charged when the circuit is closed and the resulting discharge, being too heavy to be carried wholly by the short-circuiting carbon deposit, finds a path through the air across the points, making the requisite spark. Plugs were exhibited in operation; to show the effect of the condenser action, short-circuiting was effected by means of

wet strings, effectually stopping sparking under ordinary conditions, but not preventing sparking when the condenser was thrown into the circuit.

DIEZEMANN SHOCK ABSORBER.—A Diezemann shock absorber was shown attached to a spring and section of frame mounted on a table. Several samples of the device were at hand for inspection and the internal construction was shown by means of one of the devices made of aluminum and sectioned to one side to show the friction plates. The Diezemann is one of a large number of shock absorbers that have made their appearance during the present winter. It operates on the friction principle, a plate carrying a brass barrel being bolted to the side frame and containing a movable shaft with integral friction plates. Fiber friction discs and rings are interposed between these plates and the ends of the stationary barrel. A reciprocating arm is keyed to the rotating shaft, and at its other end is pivoted to the end of a link whose lower end is hinged to the car spring. Tension on the friction plates is maintained by a sunken screw plate that screws into the end of the barrel. The barrel is packed with grease.

EDMUNDS & JONES MFG. Co.—The full line of E. & J. automobile gas lamps, including those especially adapted to light and medium-weight touring cars and runabouts, was exhibited, together with a very handy little tail lamp, which will stay lighted. A very handy generator was also shown.

EASTERN CARBON WORKS.—At this stand there was a full line of the company's dry carbon cylinder and carbon porous cup batteries, carbon cylinders, plates, disks, boxes, rods, brushes, etc., besides pocket flashlights of various shapes and sizes. One novelty which claimed attention was a new battery connector the feature of which is a rubber washer next the knurled nut, which prevents loosening under any condition, the rubber, under the pressure of the nut, jamming so securely that no amount of vibration budes it. The company has taken out English, French, German and Italian patents on this little device, of which over 300,000 were sold in this country during 1905.

ENGLISH MERSICK Co.—Finished brass specialties, with handles, hinges and such auto hardware predominating, were shown at this stand. Strictly hand-made lamps of the new French styles, and a special railroad tail light that, it is claimed, can be seen four miles, were also exhibited, as was a new type of gas generator. Newest among the lamps were neat little incandescent roof and side lights for interior illumination of limousine and landaulet bodies. A new door lock for limousines was shown of the double acting type. Beautiful souvenirs in spun brass ash trays with match box holder in center, were given to visitors.

EDISON STORAGE BATTERY Co.—The Edison storage battery was shown complete, and in sections to show the arrangement of

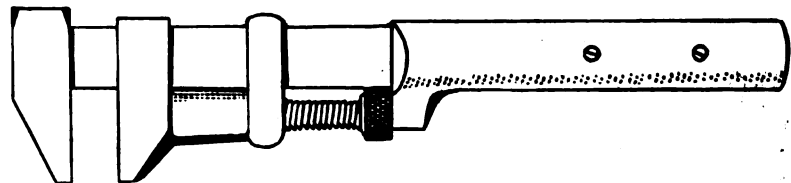
the parts. A number of plates and other parts were shown separately.

GRAY & DAVIS.—Six new patterns of lamps were added to the G. & D. catalogue for this year, and all were exhibited at the show. The new generator is in three parts—ash can in the bottom, carbide basket in the center fitted with a central circular inverted standpipe screen; the water tank above is supplied with cut-off. Increased economy and better service are claimed for the new generator. The new lamps are designated by the numbers 51, 55, 56, 29, 19 and 17.

HORACE E. FINE.—Metal monograms, of which this manufacturer makes a specialty, were shown. There were also displayed license numbers, lamp markers, goggles and metal polish.

A. H. FUNKE.—A new pattern of the Autolyte, an open front and open back lamp, was shown, together with five new patterns of auto horns.

GREEN, TWEED & Co.—A very ingenious lubricator in several styles has been brought out for this season and was displayed by this company. A principal feature of the oiler is that the pumps are individually removable by merely taking out half the cover of the case and sliding them out of slots in the



COES STEEL HANDLE WRENCH WITH EXTENDED JAW SUPPORT.

other half of the cover; thus, with a duplicate pump in reserve, any one of the pumps can be removed and laid in the tool-box until the garage is reached. If it is desired to permanently cut off one of the leads, any of the pumps can be removed and a cover placed over its slot. A camshaft passing through the longitudinal center of the case moved the pump up and down, the plunger being stationary. This movement keeps the oil agitated. The throw of each pump is regulated by an adjustment screw, so that delivery can be varied. As the oilers are made with four and eight pumps, the number of leads can be any number from one to eight. Monitor sight-feeds and vacuum check valves are furnished with the lubricators. The oilers are made for automobile and stationary engines, the latter with two compartments, for light and heavy oils. The automobile oilers are positively driven by gears or chains.

GRAY-HAWLEY MFG. Co.—This concern exhibited Gray mufflers and signal whistles, single and chime, to be sounded by the exhaust gases from the motor. The whistles were shown connected to pumps so that they could be sounded for the benefit of prospective purchasers.

F. A. GOEBEL.—An exhibit of lock switches for automobile ignition circuits. The switch is entirely inclosed in a box-

like casing with rounded corners and edges; a flat key inserted in a keyhole in the side of the switch is the only means by which the current can be turned on. The contact is of the knife-blade type. When the switch is locked the case is locked and cannot be removed.

GLEASON-PETERS AIR PUMP Co.—A variety of air pumps for tire inflation and other purposes, operated by hand, foot or power. A three-cylinder high-compression power pump was shown in actual operation, being run by an electric motor.

GAS ENGINE WHISTLE Co.—Whistles to be blown by the exhaust gas from the engine were shown in several varieties.

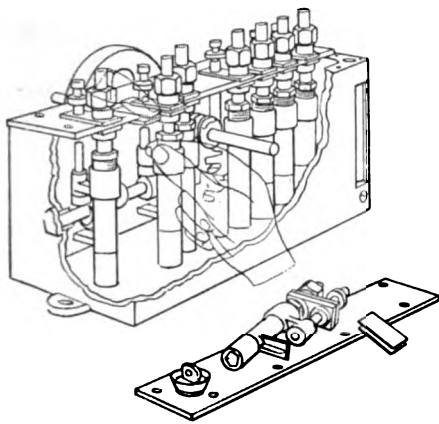
GABRIEL HORN MFG. Co.—Two, three, four and eight-tube chime horns to be sounded by exhaust gases from the engine formed the main exhibit. It is claimed that real tunes—in the key of C natural—can be played upon the eight-chime horn, the keyboard being fastened to the side of the body in easy reach of the fingers of the chauffeur. The Gabriel concern also demonstrated the Foster shock absorber, a device for relieving the strain on automobile springs.

GILBERT MFG. Co.—A variety of the fabric and leather specialties made by this con-

cern, consisting of tire cases, inner tube cases, grease bags or boots for joints, storm aprons, car covers, lamp covers, and so on.

C. T. HAM MFG. Co.—The selling agents of this concern, John H. Graham & Co., showed a full line of Ham Cold-Blast automobile lamps and oil burners that prevent the flame from being blown out and throw a brilliant shaft of light without smudging the burner or sweating the front glass. These results are obtained by the employment of the "cold-blast" principles. When cleaning is desirable, the Ham lamps can be taken apart and put together readily in a short time. Headlights, side lamps and tail lamps are included in the Ham line.

R. E. HARDY Co.—Ignition plugs for standard motors on the market were exhibited. This concern manufactures plugs in six types and forty-seven sizes. They are made with mica insulation and with porcelain cores, with American threads or with metric threads. In the porcelain-insulated plugs the porcelains are made in two pieces, so that the inner porcelain, which is considerably the hottest when in use, can expand without danger of cracking on account of the comparative coolness of the outer end. Mica plugs are made with sheet mica wound cores, the inner layer of mica being pro-



GREEN TWEED INDEPENDENT PUMP MECHANICAL OILER.

tected by mica washers. No shellac or glue is used. All Sta-rite plugs are readily taken apart for cleaning. Special terminals and clips can be supplied.

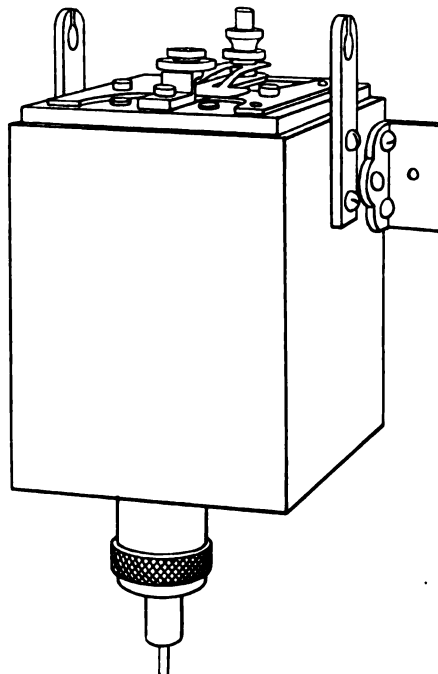
Hess-Bright Mfg. Co.—Non-adjustable ball bearings of the two-point bearing were exhibited in all sizes. These bearings are made in the same way and in the same styles as heretofore, except that the style known as "full-ball" bearing has been discontinued. This consisted of a solid circle of balls, as distinguished from the newer type, which has short spiral springs separating the balls. With the full-ball type a gate had to be provided for the removal of the balls; in the new type compression of the springs forms a gap which allows the relative position of the races to be shifted sufficiently to allow the balls to be removed. A number of standard transmission gears were shown fitted with Hess-Bright ball bearings. The Hess-Bright company naturally points with pride to the record of victories for cars fitted with its bearings—the Gordon Bennett, Vanderbilt and Florio cup winners being so equipped. The varied uses for the H.-B. product was well shown by the Apple dynamo, La Coste magneto, Cadillac hub, Franklin (light), Frayer-Miller, Brown-Lipe, American Locomotive Co. (Berliet) and Mack Bros. five-ton sight-seeing car transmission—all mounted on Hess-Bright bearings.

Hyatt Roller Bearing Co.—New self-containing guide yokes have been added to the Hyatt roller bearings for this season. When the bearings are in action the projections do not touch the rollers nor interfere with the action. The difference in friction in plain bearings and the Hyatt roller bearings was forcefully demonstrated by means of two small trucks on a steel plate, each loaded with 250 pounds dead weight. Handles invited the public to "take hold," and the ease with which one truck could be rolled as compared with the other was convincing. Two heavy motor flywheels, mounted, helped along the demonstration.

A. W. Harris Oil Co.—The Harris Oil display differed from all the other oil and

grease exhibits in that a convincing exposition of the fluid qualities of its oils for gasoline and steam engine lubrication was given by means of a polished, grooved incline down which the oil flowed from cans above into similar receptacles below, the cans being reversed when the lower ones were filled. Special cylinder and transmission oils and heavy greases for chain and gear lubrication were exhibited. Harris oils are made with special reference to the requirements of automobile engine lubrication. In the Harris line are light, medium and heavy-bodied cylinder oils, specially adapted for cold weather automobiling, splash system lubrication, motorcycle work and steam engine practice, besides semi-solid oils and greases for chain and gear lubrication.

Hicks Speed Indicator Co.—A strong feature of the Hicks speed indicator made



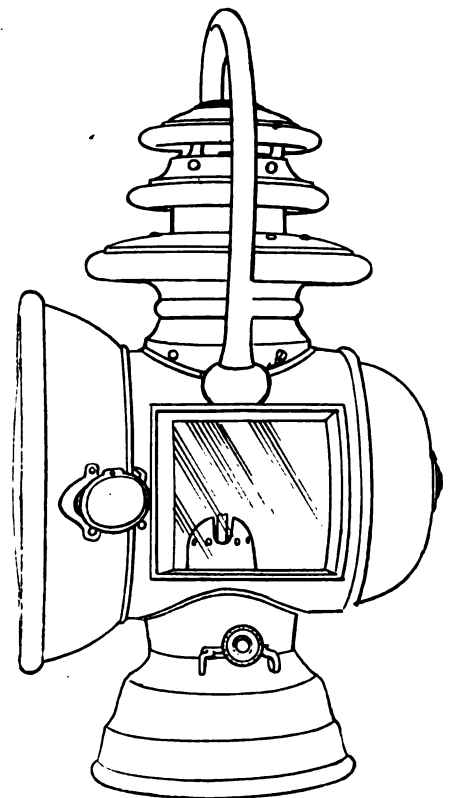
HEINZE SINGLE DASH-BOARD COIL.

by this concern is that the hand or pointer is free from fluctuation or vibration at all times, whether speed is rising or falling, slowly or rapidly. The pointer is quite stationary when the speed does not vary. The standard instrument has a rectangular face and the pointer moves over a graduated arc, with very plain figures. Below the speed scale is a total mileage odometer reading up to 99,999.9, and above the speed scale is a trip odometer reading to 999 miles; this can be turned back to zero at any time by a milled knob at the side of the case. The case is attached to the dashboard and the face is placed at an angle so that it can be conveniently read. The manufacturers state that there are but three gears used in the speed indicator mechanism.

E. F. Hodgson.—A unique exhibit made for the first time at an American automobile show was a portable garage, which was dis-

played in the basement of the Garden by E. F. Hodgson, of Dover, Mass. The exhibit was a full size 10 by 15-foot "Wig-warm" house made in a dozen separable sections, each constructed of light trussed wood framing sheathed with overlapping weather-boarding laid over weather-proof roofing paper. The floor was of heavy planking and had a trap door to cover a pit to be dug in the ground under the house. There were two windows in each side, one in the rear above a workbench, with lockers at either side, and one in each of the double doors. The walls of the building were surmounted by a gable roof in four sections, forming a peak in the center.

Henry Hooker & Co.—Three styles of auto bodies were exhibited, a side-entrance phaeton for five or seven passengers, painted automobile red, upholstered and grained leather to match, and having a victoria top covered with grained black leather occupying the position of prominence. This body was unusually long and wide back of the front seats and was provided with spacious pockets on both sides for the ception of miscellaneous small articles. Another exhibit was a limousine in the rough, which, like a landaulet, also in the rough, revealed attractive lines, substantial construction and good workmanship. The framing of both was of ash, the panels of white-wood and the window and door framing and the roof in red mahogany. The windows of the limousine dropped down on all sides into pockets. The mechanism of the auxiliary folding seats inside was ingenious; the seat was pivoted or hinged at the rear to open down, the same hinges having lever



GRAY & DAVIS OIL LAMP.

arms connected with a seat back that slid in metal slots in the paneling of the body. When the seat was let down the back slid up and its upholstery was flush with that of the rest of the body. In the landaulet the extra seat arrangement was different, the seats merely sliding forward out of slots under the front seats, and being provided with stationary iron legs fitted with roller feet. These legs are concealed from view, when the body is upholstered, by an apron or short curtain.

HILL MFG. Co.—This concern exhibited samples of automobile tops, which are manufactured in all sizes and of all suitable materials. The Hill tops are strongly constructed and the manufacturers guarantee the fixtures and joints not to rattle.

HUTCHISON ELECTRIC HORN Co.—This company exhibited an automobile horn to be sounded by electricity, producing a sound peculiar to this horn. Battery current is used for sounding the horn by vibrating the reed, and pressure of a button closing the circuit.

HAVEMEYER OIL Co.—Havoline gear lubricating compound was shown at this stand. It is a special lubricant made for transmission gears. The Havoline fluid oils of the company were also shown.

HYDRAULIC OIL STORAGE AND DISTRIBUTING Co.—The Snell hydraulic system of handling gasoline and other oils by water power was exhibited.

HATCH & BRITTIN.—The U. S. emergency surgical case with everything requisite for first aid to the injured was shown for the first time at an automobile show. The exhibit was attractively displayed.

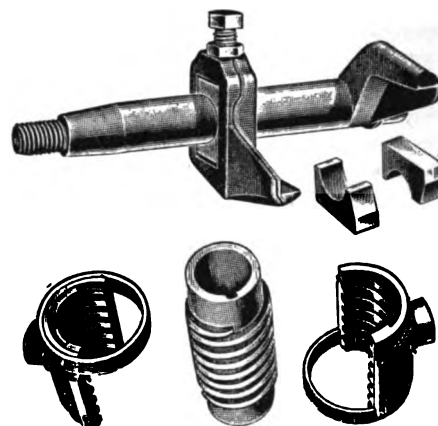
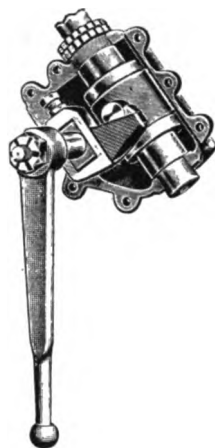
HEINZE ELECTRIC Co.—This concern displayed a dozen different sizes of ignition coils fitted with a very rapid vibrator.

HARTFORD SUSPENSION Co.—The Trufault-Hartford shock absorber was demonstrated by a mounted model. The fact that this device is used on many leading European cars has done much to popularize it in America. The device offers frictional resistance to excessive play of the springs of a car. The announcement that this concern had secured the sole American selling agency for the Gobron-Brillié car caused much comment.

HERZ & Co.—The 1906 timer manufactured by this company shows the plungers set in the case instead of on the shaft. They are operated by a cam on the shaft. This gives an opportunity to the user to adjust the plungers to meet requirements. An exhibit of primary and secondary wires and terminals was also made.

HOLLEY BROS. Co.—The well-known Holley magneto and the new Model E carbureter were capably demonstrated by the attendants, with the aid of working models. This concern had its magnetos and carbureters on many of the more prominent American cars in 1905, and 9,000 of the carbureters were sold during the first nine months of last year.

P. M. HOTCHKIN.—A brand new shock absorber or "anti-jolt" device in the market is the Hotchkin, which was shown and demonstrated in the Garden basement. It operates on the hydraulic principle, a circular case adapted to be bolted to either the car frame or the spring being filled with glycerin and having a check valve on one side. To a central shaft in the case is attached a moving wing or arm that forces the fluid ahead of it in either direction as the wing is moved by a reciprocating arm attached at its free end to a link connected with the frame if the case is fastened to the spring, and to the spring if the case is attached to the frame. When the frame goes down and the car spring is under tension the glycerin passes through the check valve freely, but on the rebound the check valve closes and the fluid is obliged to find its way slowly back to the other side of the valve by means of constricted passages through a



BARNES ADJUSTABLE STEERING GEAR, SHOWING COMPONENTS ASSEMBLED AND SEPARATE.

stop block in the case. This checks the rebound and prevents pitching about of the body and possible breakage of the springs.

IRON CLAD MFG. Co.—Steel gasoline storage and shipping barrels, with pumping outfits, constituted the bulk of this display, a model of the pump—made by the Tokheim Mfg. Co., of Cedar Rapids, Iowa—being shown in operation. One handy novelty was an auxiliary separate tank for long-distance touring. This is made in sizes ranging from two to five gallons, and owing to the size several can be nested and stored away in a car. A handle facilitates carrying the tanks about.

IMPERIAL BRASS MFG. Co.—The full line of Imperial specialties was shown, consisting of centrifugal and auxiliary oil pumps, automatic lamp adjusters, compound air pumps, garage pumps, pipe fittings, priming cups and brass and aluminum castings.

JANNEY, STEINMETZ & Co.—An elaborate display of tanks in all sizes, together with a very complete display of wrenches, formed most of the exhibit of this concern. A new tire iron for setting lugs, the Hill lock valve which will cut off the supply of

gasoline instantly and can be opened only by a key, and a display of tank gauges was also made.

JONES SPEEDOMETER.—An electrically lighted showcase contained fifteen different models of speedometers, odometers, tachometers and autoclcks. A new annunciator, designed primarily for use in limousines, is the latest production by Mr. Jones. It has a press-button disk with eight signals which communicate with an annunciator on the dashboard, ringing a bell and at the same time illuminating by electricity a printed signal to the driver of the car. Another new production shown was a French movement eight-day auto clock.

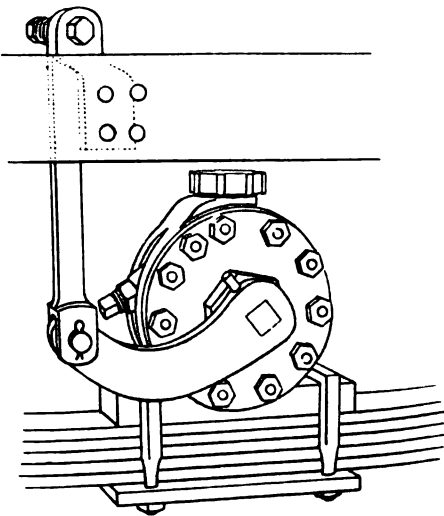
J. C. JUDSON Co.—Standard carriage lamps in twenty patterns were shown, and also Peerless auto-heaters, Skinner compound pumps, samples of monograms and crest engraving, a complete line of the new Scott mufflers, also the Burke climbers in

over fifty sizes to cover every tire made for both pleasure and commercial vehicles. The Judson company represents the output of forty factories.

PHINEAS JONES & Co.—Wood, artillery type wheels shown in the white or natural were displayed, together with samples of the materials used in their construction.

KLEAN-ALL MFG. Co.—This exhibit consisted of the special soap called Klean-All, intended for the use of automobilists or others whose sport or business brings them into contact with grime or dirt. The soap is said to be a vegetable compound, harmless to the skin but efficient as a dirt remover.

KINSEY MFG. Co.—Radiators for water-cooled gasoline motors and mechanical oilers were exhibited by this company. The radiators are made with flat, vertical tubes 3 1-2 inches wide with a water space of 3-16 inch; this construction makes a radiator which, the manufacturers state, will not easily burst when the water is frozen, as the walls expand instead of cracking. Fins with large radiating areas are placed on the tubes. The Kinwood mechanical oiler

**HOTCHKISS SHOCK ELIMINATOR.**

also shown is of the type in which each feed has a separate pump. The pumps can be worked individually by hand if desired.

KILGORE AUTOMOBILE AIR CUSHION Co.—The Kilgore pneumatic shock eliminator made its first show appearance this year, and attracted much attention. It is substantially made of drawn brass cylinders with a strong plunger that moves up and down with the action of the spring, compressing the enclosed air at the ends of the cylinder and cushioning excessive jolts.

KIRKHAM MOTOR MFG. Co.—Single, double cylinder air-cooled and four-cylinder water-cooled motors were exhibited by the Kirkham company. The smaller sizes are for motorcycle use, or other purposes where a light, air-cooled motor is desirable. An interesting engine is the two-cylinder mo-

torcycle engine with cylinders placed at a V angle and having the connecting rods working on a single crank. This has a bore of 3 inches with 3 1/4-inch stroke, and develops 5 horsepower at 1,800 revolutions a minute; the weight is 64 pounds.

W. J. KELLS MFG. Co.—Five forms of cellular or honeycomb radiators, three styles of hinged hoods, a copper riveted gasoline tank of large capacity and pressed sheet steel mud fenders were shown by this company. As a novelty, a section of fin tube coil radiator was displayed.

JULIUS KING OPTICAL Co.—A large line of auto goggles and everything pertaining to this line of specialties was shown.

FRIED. KRUPP Co.—This famous German concern showed a line of special grades of steel in axles, shafts, gears, etc. It was represented by Thomas Prosser & Son, of New York.

LACKAWANA LEATHER Co.—A fine display of chrome-tanned body trimming and top leathers in all shades was made. The samples were large and hung over a rack in neat folds.

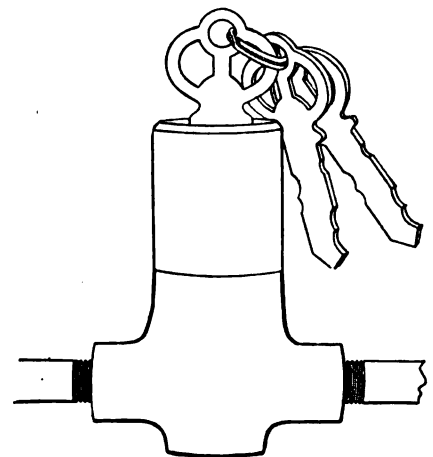
LOCK-SWITCH MFG. Co.—An electric lock switch, designed to prevent the theft or unauthorized use of a car was the specialty shown. This concern also demonstrated its tire pressure indicator to prevent over-inflation and unequal pressure on the tires of a car.

LUNKENHEIMER Co.—The operation of the lubricators made by this concern was well shown by a six-feed oiler in constant operation. The Lunkenheimers are now supplying the Locomobile Company with three-feed and six-feed lubricators and the Peer-

less concern with the six-feed type. A comprehensive display of the big line of oil pumps, valves, oil and grease cups, spring key cocks and chime whistles made by the company completed this interesting exhibit.

LIGHT MFG. & FOUNDRY Co.—A very interesting exhibit of many aluminum, manganese, bronze and phosphor bronze castings that enter into automobile construction. The growing use of aluminum and bronze in this connection made the display doubly attractive.

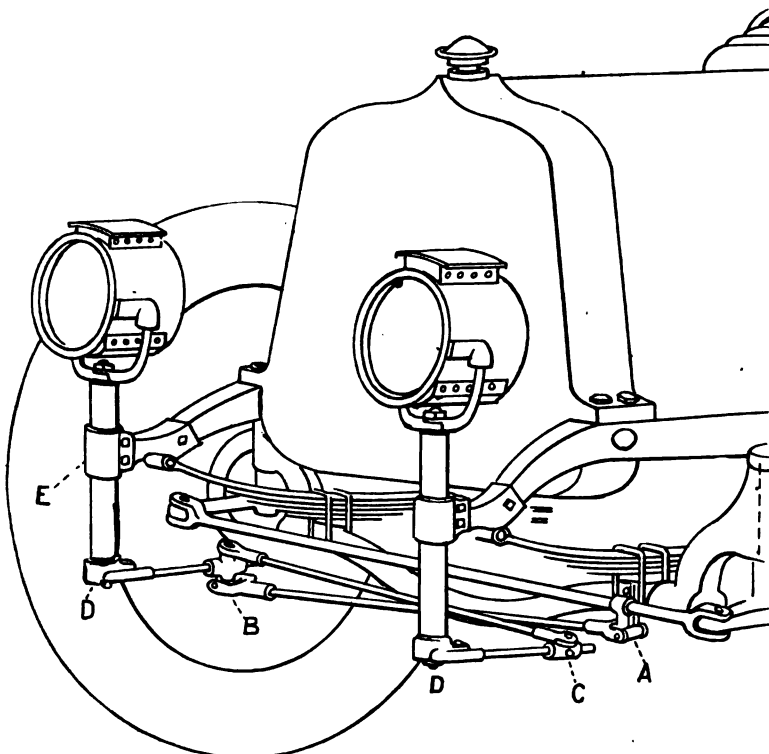
MOTOR CAR EQUIPMENT Co.—A variety of automobile accessories and attachments, including the ignition apparatus manufactured by the Connecticut Telephone & Electric Co. and the Continental Calliope—a chime signal horn blown by the exhaust. The company also showed a French siren horn operated by a friction pulley brought

**HILL GASOLINE LOCK VALVE.**

into contact with the engine flywheel and producing a sound which cannot be ignored. Continental lamps, Blanchard horns, of which the company has exclusive control in America, Geece batteries and an electric drill were also exhibited. Importations of the French Alpha lamps and a special line of Italian rubber and cambric faced cables were shown. Among the prominent features was the new Coes steel handle wrench with bar and head piece in one solid forging. They are made from 6 to 21 inches in length, the 12 to 21 inch sizes having ball bearing screw.

MANUFACTURERS' CAN Co.—This firm manufactures for the trade only, its product consisting of receptacles for oils and greases, the receptacles being suited to their contents. Oil cans, for instance, are made with faucets through which the oil can be drawn off and with handles for convenience in carrying; the shipping crates are so made that they can be used for stands.

MANUFACTURERS' FOUNDRY Co.—Cylinder castings completely machined and tested are the specialty announced for this year. A beautiful example of cylinder grinding was exhibited. The cylinder was cut in half lengthwise for observation purposes.

**IMPERIAL-LYON AUTOMATIC LAMP ADJUSTER.**

A, Knuckle rod clamp. B, Gear rod double clamp. C, Gear rod single clamp. D, Barrel. E, Barrel clamp.

Castings in all stages of finish were also shown.

MIDVALE STEEL Co.—Midvale automobile steel, a product of this company, made especially for use in automobiles, was shown in many forms, the display of gears being particularly effective.

MIDGLEY MFG. Co.—Pressed steel automobile wheels that look exactly like the wooden article when finished were shown in various sizes, and a display of component parts in all stages of finish was made. The Midgley company also makes the new Dunlop universal rim for wood or steel wheels.

L. J. MUTTY Co.—Samples of high-grade rubber cloths were shown. A specialty was a double texture mackintosh cloth for automobile tops, curtains, etc.

MCGIEHAN MFG. Co.—Plain odometers, combined trip and total odometers and combination odometers and speed indicators were exhibited at the McGiehan stand. The form of the McGiehan instrument is rectangular, the speed pointer playing over a semi-circular scale; in the combined instrument the odometer is above the speed scale. Still another model combines speed indicator, total odometer and trip odometer, the latter being turned back to zero by a milled knob. Drive is by flexible shaft from a gear on the front wheel.

MANHATTAN AUTO TOP Co.—The exhibit by this concern comprised a "Perfect" overhead revolving washer supported on a gas pipe frame, several styles of four-bow extension tops covered variously with khaki colored cloth, pantasote, mackintosh and leather. The company also showed an enameled leather hamper of large size and brass monogram. A small but leading feature was a Heath "dry gas" carbureter, floatless and having a wire net cage with a small fan in the bottom mounted in the upper part of the cylindrical barrel. The arrangement is such that the inrushing air rotates the wire cage and breaks up the gasoline particles to more thoroughly commingle them with the air molecules.

CHARLES E. MILLER.—One of the most extensive displays of automobile accessories was made in the Armory by this pioneer importer and dealer. It includes tires and tire attachment such as anti-skid treads and Weed tire chains, gas and oil lamps, pumps, spark plugs, a large assortment of tools, horns, sirens, chains and similar articles. Especial attention was called to the ability to supply imported horns and Brampton chains at prices on a level with the domestic goods. An interesting novelty for the car owner was a combination siren and reed horn, just added to the big Miller stock. This has a bulb and flexible tube and a reed in the horn like an ordinary horn to be operated with the hand, and in addition a rotating aluminum wheel with suction air ports constituting the siren feature. The rotating wheel is driven by a flexible shaft having a pulley which is carried at the end

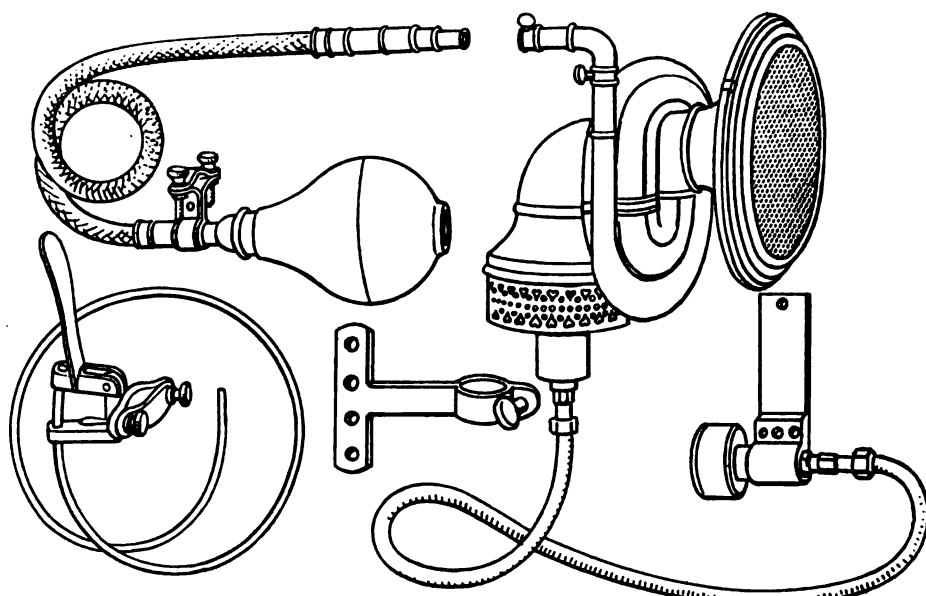
of a short spring in such a position that it can be depressed by the foot into contact with the engine flywheel. When in motion the rotating wheel draws in sufficient air to sound the horn, the note varying with the rate of revolution. The horn proper has three turns and an ovate bell, gauze protected. A specialty of particular interest to garage managers was a combination tool cabinet and workbench. This was of oak, strongly built and having various drawers and cupboards equipped with about 250 small tools of all sorts generally needed in a repair shop, each tool having a special place provided for its keeping. A special locking mechanism was fitted to lock all the drawers simultaneously when the key is turned in the main door of the cabinet. Mounted on top of the bench was a small electric lathe and a vise. The cabinet legs were fitted with rollers so that the cabinet can be rolled readily about the floor into any

of fire a plunger in the large end is struck against anything convenient to break the bottle of acid within the extinguisher, and the nozzle is pointed at the fire. A stream can be thrown a distance of thirty to fifty feet. The bottle of acid is hermetically sealed by blowing the glass together, so that no corking is necessary. This prevents deterioration of the acid.

MOTSINGER DEVICE MFG. Co.—This company showed the Auto-sparker, the construction of which has not been materially changed for 1906. The makers state that the present outfit gives such excellent results that alteration is unnecessary.

MAYO RADIATOR Co.—This concern displayed several types of its radiators, among them the cellular, flat tube and Mercedes varieties, besides several specimens of aluminum hoods, dashes and water connections.

MOTOR CAR SPECIALTY Co.—The Lea Speedistimer was shown. The instru-



MILLER COMBINATION SIREN HORN OPERATED MECHANICALLY OR BY BULB.

desired position, when by depressing a pedal the rollers are withdrawn into the legs and the cabinet settles into a fixed position.

MCCORD & Co.—The operation of the five, six and seven-feed McCanna lubricators of this concern was well demonstrated by means of a model of the six-feed variety kept constantly running. There was also exhibited the full line of McKim gaskets for automobile work, besides a working model of the Hibbard automatic tire pump attached to a mounted automobile wheel.

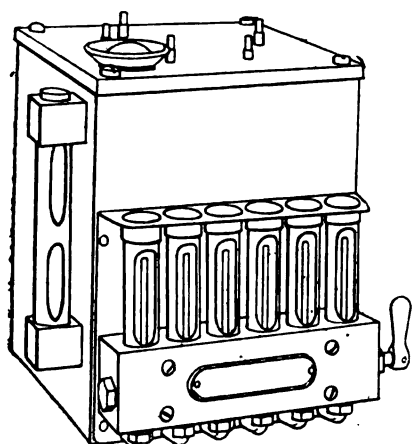
MINIMAX Co.—A conical fire-extinguisher possessing several good features formed the exhibit of this company. The extinguisher has the nozzle at the apex and the usual bottle of acid in a cage inside the large end. A handle on the side is so placed that the apparatus is readily manipulated; in case

ment has a clock movement, by means of which speed, distance and time are recorded. The Lea speed meter and tire-pump were also shown.

A. R. MOSLER & Co.—The Spit Fire spark plug was shown with a new fiber protector; in addition, a new Mosler eccentric timer with Hess-Bright ball bearings and a new transparent dashboard coil with heavy plate glass facings were displayed.

MANHATTAN STORAGE Co.—The majestic lamp in ten styles and more than forty sizes was shown as a leading feature by this company. A new type of lamp with a special lens set in the front glass attracted much attention. There was also a line of Majestic clincher tires and tubes. The general line of supplies handled by this concern was also shown by sample.

WM. P. MILLER'S SONS.—Perhaps the most interesting of the various oils and



HILL OILER WITH SIX SIGHT FEEDS.

greases exhibited by this concern is a grease which, the manufacturers state, is entirely unaffected by changes of temperature within a range from zero to 200 degrees Fahrenheit, so that it will not be melted out of grease cups by ordinary bearing temperatures, and will not become too hard to work properly when cold. Other oils and greases are also manufactured for all kinds of automobile work—special lubricants for special purposes. A dressing for friction drives and for motorcycle belts is a specialty.

MORGAN & WRIGHT.—An exhibit of the full line of M. & W. tires, with the usual sections showing their construction, and tools for their removal and attachment.

NATIONAL CARBON Co.—A new dry battery cell was shown—the Columbia igniter—designed especially for four-cylinder engines and made in all sizes and at same prices as the regular Columbia line. A display of small incandescent hand lamps was also made.

N. Y. & N. J. LUBRICANT Co.—Non-fluid oils in all sizes of cans ready for immediate use were piled ceiling high at this stand. Great economy is claimed for this lubricant, as it does not drop and waste, while, unlike greases, it does not require the bearings to grow warm before lubricating. A non-carbonizing gas engine cylinder oil was also shown.

NEW YORK CARRIAGE TOP Co.—An Empire extension top was shown on a side-entrance phaeton body, both finished in black. The top had pantasote covering, polished brass joints, and bows covered with hand-buffed bow leather. A beveled plate glass wind shield with mahogany frame formed part of the outfit. The side and rear curtains had large celluloid lights. Samples of cover pantasote in three colors and half a dozen samples of mackintosh cover cloths were also displayed.

NEW YORK SPORTING GOODS Co.—The automobile supply department of this house had a varied exhibit of auto horns, lamps, clothing and novelties in accessories.

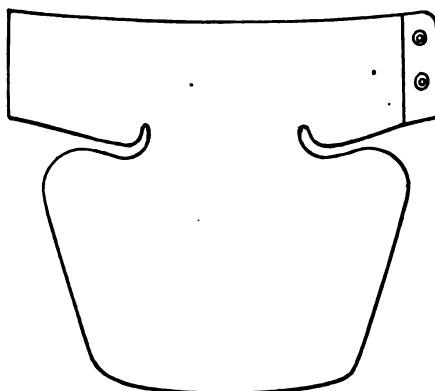
NATIONAL SALES CORPORATION.—A varied assortment of specialties was exhibited, among which were the G. C. dry storage batteries and individual charging outfits for

direct-current voltage; Connecticut coils in box and dash types in various sizes, new coil current indicator, ampere and volt meters, Dodge lubricator with positive time, and Metzger Sootproof plugs.

NOERA MFG. Co.—Compound automobile pumps, oils, guns, and oil cans big and little, constituted this exhibit, which was plentiful in range of samples and variety.

NATIONAL BATTERY Co.—Storage battery cells for electric vehicle service were shown, together with storage batteries for every service, sparkers for ignition, etc.

NONPARIEL MUFFLER Co.—In addition to a muffler, this concern exhibited a small water pump, to be operated by steam or compressed air. Its special feature is that it contains no moving valves, the pistons and plungers being drilled with holes which, alternately covered and uncovered, act as valves. The pump has a maximum capacity



SCOTT MUFFLER AND CHEST PROTECTOR.

of 3 1-2 gallons a minute, weighs twelve pounds, and is especially adapted to steam cars and other small steam plants.

F. W. OFELDT & SONS.—The Ofeldt water tube steam generator for steam cars was demonstrated in operation with an Ofeldt kerosene burner, the steam generated being used to drive a three-cylinder compound horizontal engine. The generator and burner were encased in a galvanized cylinder having a mica window in front, through which the blue flame of the burner could be watched. No perceptible odor emanated from the vent above the generator.

OLIVER MFG. Co.—The Peerless automobile jack, made by this company, was shown in five sizes. W. L. Ash, president and general manager of the Never-Miss Spark Plug Co., of Lansing, Mich., was also at this stand, which he made his headquarters for meeting his eastern customers.

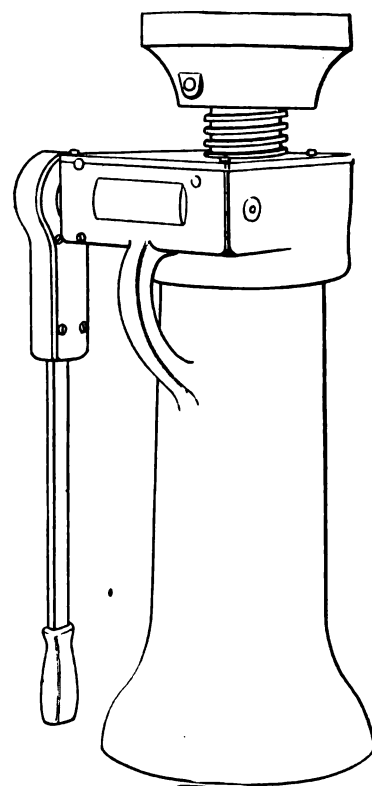
PARISH & BINGHAM Co.—This concern showed specimens of the frames it supplied for the Peerless, Pierce-Arrow, Stevens-Duryea and Maxwell cars, besides brakes and clutches in the rough.

PREST-O-LITE Co.—Tanks manufactured and filled with compressed acetylene gas by this company are too frequently seen on automobiles to require extended mention,

and their use is so simple as to be obvious. A tank full of gas, a valve, and a hose connection to the lamp constitute the entire apparatus; a special key is provided for turning the valve, so that it cannot be tampered with. A pressure gauge sunk in one end of the tank shows the amount of gas remaining at any time. Prest-o-lite tanks are made in two sizes, holding respectively 40 cubic feet and 70 cubic feet of gas. Tanks when empty are exchanged for charged tanks at a moderate cost. The factor of safety combined with its non-freezing quality has made this tank a favorite means of automobile illumination, especially in sections where extreme winter weather is to be expected.

PITTSFIELD SPARK COIL Co.—Pittsfield coils, ranging from two to six units, commutators and Jewel spark plugs in profusion were shown. The exhibit was varied and extensive and well displayed. The company has entirely recovered from the disastrous fire of last February, which entirely destroyed its plant.

POLYPHASE IGNITION SYSTEM Co.—Two high-tension magnetos with non-vibrating single condensing coil and spark plugs, and one low-tension magneto with make-and-break sparking mechanism were on exhibition. These generators, which the company has just perfected and is preparing to place on the market, are of the induction type, having no moving wire and no contact brushes; the H armature is the only moving part. It lies diametrically through the center of circular magnet built up of two steel ribbons wound like a clock spring with insulation between the windings. The



ROTH HEAVY-DUTY JACK.

construction is such that there are two paths through which the lines of magnetic force may travel, the current taking the path of least resistance when the armature is in a position where the resistance in the other path becomes high. This overcomes any destructive breaking down effect in the magnet from the intensity of the resistance. The armature shape is dissemetric and causes the magnetic strength of the field magnet to increase when the armature is in operation. The primary current is interrupted by a breaker positively operated by cams and working in an oil bath. The energy of the primary current is thrown through the primary wire of a special induction coil or step-up transformer. The high tension current is distributed by a timer mounted on the body of the igniter and gear driven, the gears running in oil. The entire generator, including breaker and distributor, are encased in aluminum, with cover plates arranged to be easily removable and give access to the parts. The armature shaft is either gear or chain driven.

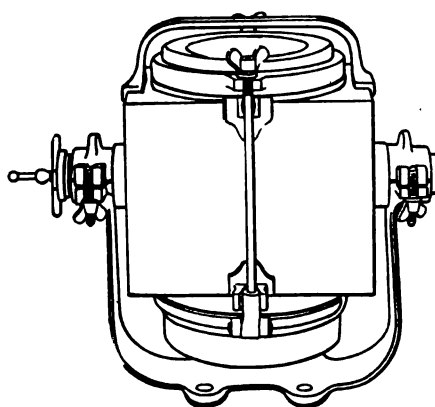
PANTASOTE Co.—A feature of this exhibit was an improvised aquarium to demonstrate the waterproof qualities of Pantasote, a large piece of which was placed on a topless square table, the resulting depression containing several gallons of water in which a dozen goldfish were swimming. The aquarium remained undisturbed during the entire week without saturating the undressed side of the pantasote. An adequate representation of Pantasote cloths, in various colors for automobile upholstery, was made.

POST MFG. Co.—The leatherless "Coat of Mail" tire protector was shown. In its particular sphere it was the hit of the Garden show. The protector consists of an envelope of rubber fabric and small steel plates, that fits around the tire, to which it is vulcanized, the armor getting all the wear to which the tire would otherwise be subjected. The envelope is molded to fit the tire exactly, the tread part being built up to five-ply of fabric. The flexible steel armor, composed of small plates, is fixed upon this tread, resulting in an unpuncturable and non-skidding tire protector.

POST & LESTER Co.—Motor car specialties for the jobbing trade and for the consumer, including Volier and Rival horns, Royal lamps and generators, four varieties of auto clocks, French and German goggles, voltmeters and ammeters, a large variety of spark plugs, Watertite tire jackets, and a large list of other standard articles.

WILLIAM M. Poz.—Rubbasilk automobile coats, a special brand, were shown in six varieties and several colors.

PATTERSON, GOTTFRIED & HUNTER.—In the new specialties shown were a broken tap extractor and a patented curved bearing scraper, also the Giant silver metal ratchet wrench. The Twentieth Century tool-box, a circular box with drawers in it, and the



ROSE SAFETY GAS PRODUCER FOR THREE LIGHTS, HUNG ON TRUNNIONS AND DETACHABLE.

Ellis off-set, adjustable S wrench, were among the latest novelties.

ROSE MANUFACTURING Co.—New patterns of Neverout lamps on exhibition consisted of a condenser mirror lens headlight made in two sizes—No. 144 with 11 1-2-inch face and No. 140 with 9 1-2-inch face—new pattern gas side lamp No. 145 and new pattern tail light No. 146. The new Miracle generator has a mechanical water cut-off and a purifying plug that filters the gas, so that the burner produces an exceptionally white and brilliant light. The water drops upon the outside surface of a conical shell which covers the carbide. The water is distributed equally over the conical surface on all sides and comes in contact with the carbide at the bottom of the shield.

RANDALL-FAICHNEY Co.—The oil guns and grease guns exhibited by this concern are made without packing, the plungers being entirely of metal and ground to fit the cylinders with accuracy. They can be used not only with oil, light or heavy, or with grease, but with fluids as "thin" as gasoline, and are guaranteed not to leak. The manufacturers have had long experience in making surgical syringes and the like, and apply the same workmanship and facilities to the manufacture of their oil and grease guns.

RANDS MFG. Co.—Eight Rands standard tops were shown in as many colors of real and imitation leather and foreign and domestic fabrics. A feature of these tops is the seamless steel tubing bow sockets, so swaged as to give a good taper, resulting in an exceptionally light and strong top. These tops are used on the Thomas, Olds and Stevens-Duryea cars. This concern is making a specialty of concealed body irons, the use of which adds much to the appearance of a car. These irons are at present used on Thomas, Pope, Olds, Aerocar, Berkshire, Waltham and Rambler cars, and the field is widening rapidly.

REMY ELECTRIC Co.—A working model of the Remy high-tension alternating current magneto attracted the public to this display. The automatic magneto dynamo igniter of the same company was also shown.

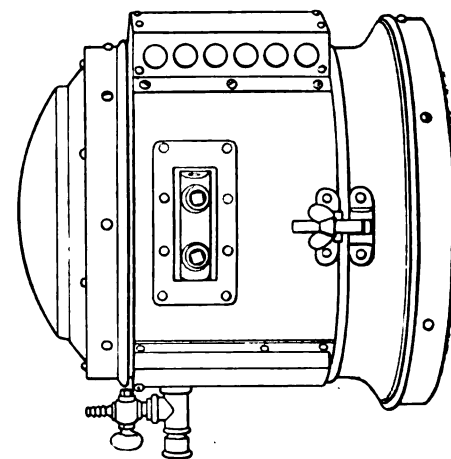
RAILWAY APPLIANCE Co.—Two interesting specialties were exhibited: the "Auto Cle" is a form of wrench which has become well known for its convenience, consisting of a steel rod with a handle at one end and a socket at the other into which can be fitted heads to take nuts of the various sizes used on automobiles. There is a universal joint, so that awkward places can be reached, and a lengthening bar. Ten nut sizes are provided for, and there is also a screw-driver bit; the set is packed in a leather case. The second specialty is the Stanwood automobile step. This is of steel strips corrugated and fastened together, the strips standing edgewise. The surface gives a good grip to the foot, and the openings allow dirt, water or snow to fall through.

LEON RUBAY.—A specialty was made at this stand of exclusively imported ignition material made by Lacoste et Cie., of Paris, France. It consisted of high and low tension magnetos, induction coils, commutators, insulated wire and spark plugs. In the line of new fittings there was shown an annunciator for closed cars, with printed lighted signals on the dash. The Edo, a new spiral spring compensator for jolting, and the Durandel tire protector, were shown as the latest novelties.

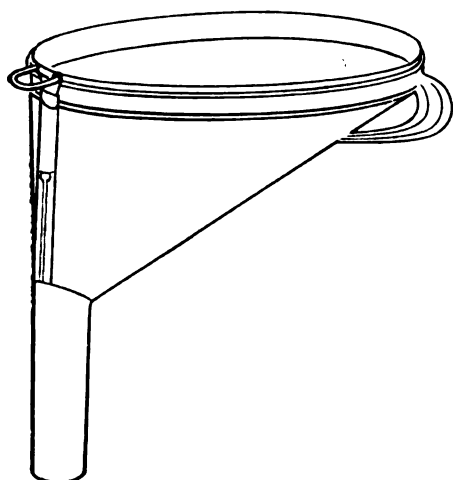
WILLIAM ROCHE DRY BATTERY Co. AND N. Y. COIL Co., INC.—The New Standard dry batteries were shown in all the regular sizes, and a new feature was a Yale lock-switch, shown on one of the coils. The Fire Ball jump spark coil and the Economy primary coils were also shown.

RUSHMORE DYNAMO WORKS.—Five sizes of a new flare front lens mirror searchlights were shown with the regular Rushmore line. A French siren horn, which has been added to the line of goods made by this house, was also shown.

FRANÇOIS RICHARD.—This French designer showed an automatic carburetor of the same type as the one used on the 250-horsepower racing car recently completed for Alfred G. Vanderbilt. The Richard carburetor has two spraying nozzles in separate chambers, and a single float chamber. Gas is drawn from one chamber as long as the motor is running at



RUSHMORE FLARE-FRONT SEARCHLIGHT.



STEVENS GASOLINE FUNNEL WITH FLOAT INDICATOR TO SHOW WHEN TANK IS FULL.

moderate speeds, but for higher speeds both chambers are drawn upon.

ROTH JACK & TOOL Co.—What is claimed to be the largest stock jack ever made was shown by this house. It is 32 inches over all, with 24-inch lift, and has 40 tons capacity. All jacks shown had bronze gears instead of steel.

STEVENS & Co.—This firm showed horns, flexible tubing and generators, all of its own make. A new dragon type of horn has been added for the season. A line of tool accessories for which the company is selling agent, was also shown.

EDWARD SMITH & Co.—A complete line of sample varnishes, japans and colors for automobile work comprised the exhibit.

SPRAGUE UMBRELLA Co.—The Sprague exhibit included various sizes of extension tops and canopies for large cars and runabouts, with the Sprague patent glass fronts in mahogany, oak, cherry and sycamore; celluloid front lights, whipcord, rubber and imitation leather covers. A display of rubber duck cover slips completed the exhibit. One of the features of the Sprague extension tops is the hood effect at the front; this consists of a downward extension of the top, which serves not only as additional protection to the occupants of the car, but also conceals the front curtain when the latter is rolled up, giving the top a neat appearance. The celluloid lights are transparent and flexible.

STANDARD ROLLER BEARING Co.—A comprehensive showing of the special ball and roller bearings for automobile use for which this concern is noted was made.

SHELBY STEEL TUBE Co.—In a handsome frame made of cold-drawn, polished, seamless steel tubing were shown, in section, many samples of this company's product in round, oval, D, square and polygonal shapes. Several specimens of heavier tubing designed for axles, etc., are also exhibited.

STANDARD WELDING Co.—This year's new products of this company included a complete line of electrically welded steel

rings, all sizes being represented. These rings are cut from the flat stock to the proper sizes, and the joints are made by a special process of electric welding. There was also a complete display of steel rims and other automobile parts, all welded by the company's process.

STEEL BALL Co.—Hill Precision Oilers, made without valves, have a new constantly visible sight feed this year which enables the driver to see from his seat each and every separate discharge of oil through the severed leads. In the individual glass tubes of the feed a perforated aluminum float is held in place, resting on the inlet pipe, and with each discharge of the oil the float jumps upward to a height in the glass corresponding to the quantity used. These sights are not placed on the oiler itself, but on the dashboard of the car. The new Krolz axle and universal joint, fitted with brake adjuster, was also shown, together with a new locking and reserve device for gasoline tanks. The Nomrah tire protector was also displayed.

C. F. SPLITDORF.—A complete exhibit was made of the well-known Splitdorf box-type coils, suitable for one-, two-, three- and four-cylinder engines. Long and short motorcycle coils, a new Yale lock switch and new magneto were also shown. The latest wood to be used in coil boxes—birdseye maple—was very effective. A new commutator with a ball-bearing shaft, and a new two-point switch, were among the novelties shown for the first time.

SMITH & MABLEY.—Imported lamps and tires were displayed, including the Billy line of "phares" and Hercules non-skidding tires.

SPRINGFIELD METAL BODY Co.—Two handsome folding tops were exhibited by this concern, both with front straps for holding the top in position. Among the materials used in the manufacture of Springfield tops is a special fabric which is very durable and is waterproof without containing any rubber and can be easily cleaned. Real and imitation leathers are said to be very popular with buyers of cars for 1906. Since the introduction of Springfield tops in 1903 the business has grown enormously, and a new addition to the factory just completed contains 38,000 square

feet of floor space. Aluminum bodies, hoods and fenders were also shown.

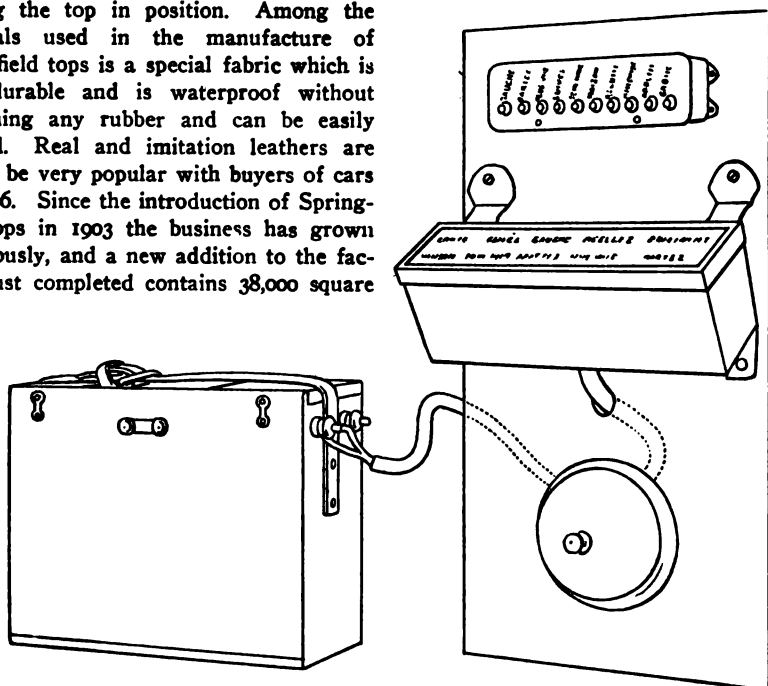
SPICER UNIVERSAL JOINT MFG. Co.—This concern manufactures fifty-one different sizes and models of this universal joint, which is of the ball-and-socket type. Several of them, more particularly adapted to automobile usage, were shown. They are water-tight and dust-proof.

SCHWARZ WHEEL Co.—Besides a comprehensive display of the Schwarz wood interlocking-spoke artillery wheels in separate parts and completely assembled the Globe automobile jack, manufactured by the Globe Jack Co., of Philadelphia, was exhibited. This jack is a light but powerful lifting device, and its simple and positive action seems to impress the onlookers.

SOLARINE Co.—A new black liquid metal polish was shown here. It is made expressly for polishing gold, silver, brass, aluminum, harness and carriage trimmings. Being black, it does not discolor the ornaments and flagrees, nor the enameled and highly polished leather surfaces. The regular Solarine Polish was also shown.

SHEDDEN MFG. Co.—The Shedden shock absorber, exhibited at this stand, consists of a special form of air dashpot for checking the excessive motion of the automobile body on its springs, preventing spring breakages and making the car ride more comfortably. This device is made either in brass or steel, as may be desired, and in two sizes, one for cars up to 1,400 pounds weight and the other for heavier machines.

SAFETY ELECTRIC ELEVATOR Co.—A working model of a novel safety electric elevator was shown by this firm. The device might well be called an automobile elevator, for it carries its own electric motor under the floor. The shaft, placed vertically, rotates a large drum having formed on its peri-



SMITH & MABLEY INDICATOR WITH TEN SIGNALS FOR DRIVER OF CLOSED CAR.

phery a worm or screw thread engaging with a series of rollers pivoted on the elevator guides, the thread passing between rollers which thus act as a nut, so to speak, and the elevator is screwed up and down when the motor is put in motion. The manufacturers claim absolute safety, simplicity and no greater cost than other forms.

SIBLEY & PITTMAN.—This firm makes Climax auto lamps and Climax battery cells, and showed a complete line of each. The firm which also imports and sells automobile supplies, showed a large variety of specialties.

SEMI-DRY BATTERY Co.—Dunn cells and Semi-dry cells were shown in the standard sizes. This company makes but one grade and states that it destroys all "seconds."

R. H. SMITH MFG. Co.—This firm, which hails from Springfield, Mass., exhibited a working model of a speedometer actuated by an electric motor. This speed meter is new on the market this year. An interesting feature of the exhibit was the removal of a portion of the outer casing which permitted the visitor to have a "look-in" at the working parts in motion.

J. H. SAGER Co.—The Sager equalizing spring, so designed and placed that it acts in the capacity of both a compression and tension spring was exhibited.

SPRINGFIELD AUTO TOP & UPHOLSTERING Co.—Two styles of extension tops with side curtains, mahogany-stained ash bows, polished brass joints, composition metal bent bow slat irons and imported waterproof mackintosh cloth constituted the

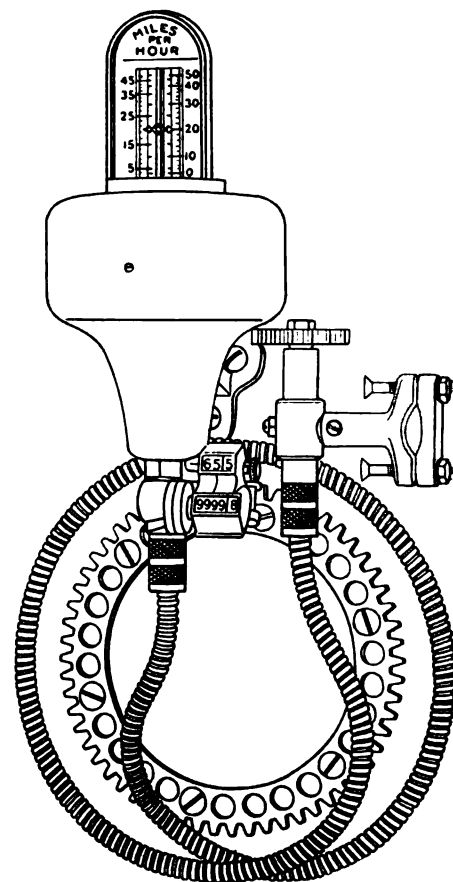
principal display. The storm apron in front had celluloid lights of generous size, while the side and rear storm curtains were similarly lighted. Another exhibit was a three-bow runabout, top covered with imported pantasote in black.

WHEELER MFG Co.—Seven Rands extension auto tops were shown, embracing several Winton, Thomas and Olds styles, covered in canvas, pantasote and rubber cloth. The tops were variously fitted with brass-plated, japanned and nickel-plated sockets and joints.

TIMKEN ROLLER BEARING AXLE Co.—At the front of this exhibit were shown eight different sizes of hubs, ranging from runabout to truck, all equipped with the Timken roller bearing, the easy running of which was demonstrated by the passing crowds keeping the wheels constantly spinning. At the rear of the booth complete axles and bevel gears similarly equipped were shown. A new axle, fitted with these bearings and known as the Hedgeland solid anti-skid auto axle, was also shown. It is a solid driving axle designed to replace differential gears, giving a positive drive to both wheels. In rounding a curve, when the outer wheel is called upon to exceed the speed of the inner wheel, it automatically disengages and runs free of the axle until the axle catches up with it, when it again engages. The axle is a continuous steel shaft. The clutch is a nut, threaded interiorly to engage the thread on the shaft. It locks the wheel to the axle and releases it automatically by riding out or in on this thread. A small tension collar is put in for the purpose of counteracting the friction between the screw and the nut, and gives the nut a tendency to draw into engagement. The clutch is not, strictly speaking, a friction clutch, as a wedge is driven into its seat instantly by the positive action of the screw, so that there is no slip.

TEEL-MFG. Co.—A neat and effective tire case for the protection of the spare tire when touring, was exhibited by this concern. The Teel case can be quickly and easily put on or taken off the tire, and is waterproof. No lacing is required.

UNCAS SPECIALTY Co.—This concern had an attractive exhibit of ignition apparatus. The Leavitt primary and secondary timers and distributors shown were well finished instruments. The secondary distributors and primary circuit maker, combined in a single instrument, has a space of 1 1/4 inches between the high-tension contact points, so that "creeping" of the current is well provided against. Primary contacts are made by accurately machined cams working on a spring plunger. The casing is cylindrical and highly polished; the cover, in the center of which is carried the leading-in secondary wire, screws into the body of the case, making the instrument tight and dust-



SPRINGFIELD SPEED INDICATOR AND TRIP AND TOTAL ODOMETER COMBINED.

proof. The central contact is made by a steel ball pressing on the center of the shaft which rotates the distributing arm. In the Leavitt primary timers a single cam comes into contact successively with steel balls backed by spiral springs, making a positive and accurate contact.

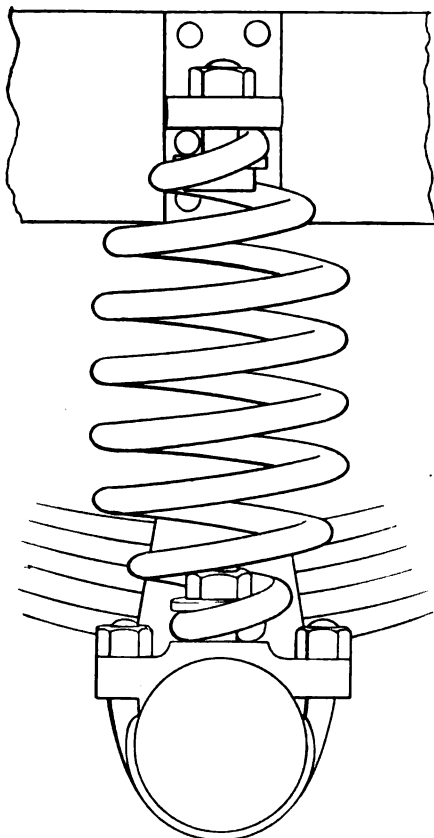
UTILITY COMPANY.—Gre-solvent, which is claimed to be "miles ahead of soap," for removing grease and grime, was shown, and samples were distributed.

VEEDER MANUFACTURING Co.—A new tachometer was shown, the latest addition to the line of Veeder specialties. A full display of odometers and tachometers were on exhibition attractively arranged in showcases, but the feature of the exhibit was the working models of all these in full operation.

VACUUM OIL Co.—This display was all Mobiloil, a special lubricant made especially for automobiles.

VALENTINE & Co.—The display here of varnishes and colors especially adapted to automobile work was most complete. No less than ninety-six superfine enamels suitable for this class of work are listed in the company's handsome catalogue.

VOORHEES RUBBER MFG. Co.—This is the first appearance of this concern at a New York show. Its specialty is the Non-Puncturable Cushion automobile tire, a feature of which is the patented cross-stay which prevents the retaining wires from cutting



SAGER EQUALIZING SPRING.

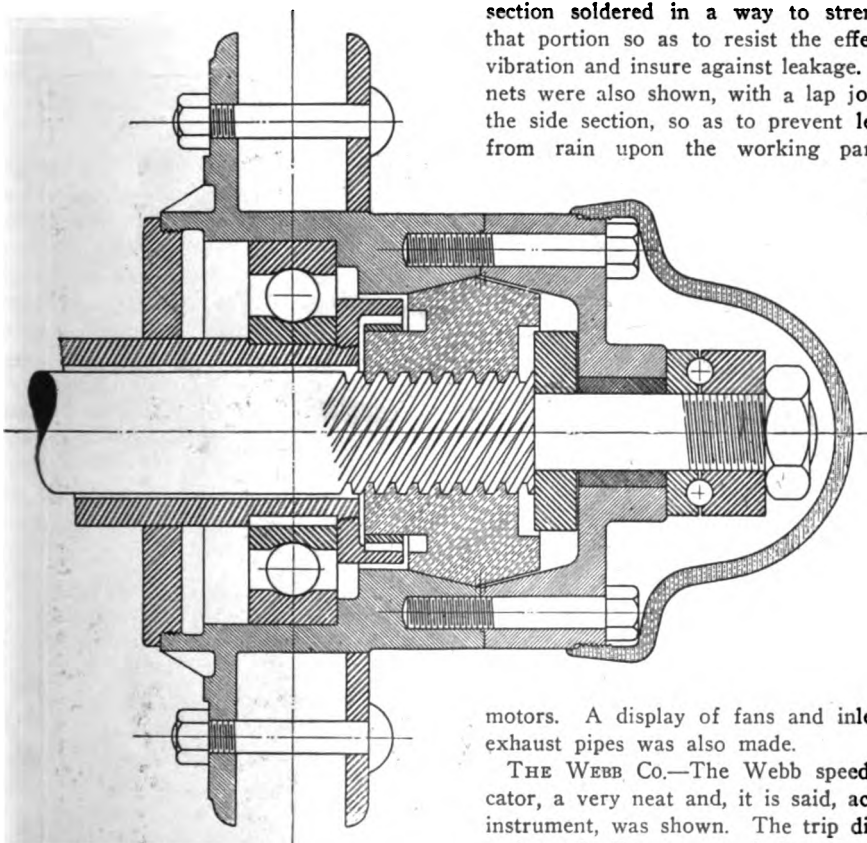
through the rubber. Some of the claims made for the Voorhees tire are ease of adjustment, lasting qualities, resiliency and anti-skidding qualities.

WHEELER & SCHEBLER.—The 1906 Schebler carbureter showed no marked changes, a modification in the float check being the only one noted. Carbureters in various stages of completion were shown.

WITHERBEE IGNITER CO.—The Witherbee storage battery igniter was shown in thirteen sizes. A non-leaking jar and carrying case was shown on the new goods. The company makes storage batteries for all purposes.

WRAY PUMP AND REGISTER CO.—Pumps in profusion, all styles, shapes and sizes were shown arranged in groups and singly. The line included the Kellogg compound double acting and Kellogg multiple gear compound pumps with register; National pressure register, Wray collapsible compound, Triplex compound, and Kellogg single action pumps, Wralog pneumatic jack, Kellogg multiple gear jack and the Ezy coupling.

WEED CHAIN TIRE GRIP CO.—This concern had ample opportunity during the early part of the week to demonstrate the effectiveness of its chain tire grips on the greasy asphalt. "Just the kind of weather we want," said the attendant at the stand. The wet weather resulted in good business—for the Weed people. At the stand where the chains were shown was also demonstrated a working specimen of Lashar's electrical speed indicator.



SECTION OF END OF HEDGLUND SOLID REAR AXLE SHOWING SCREW CLUTCH ACTING ON HUB OF WHEEL.

WAY MUFFLER CO.—The latest style of throat and chest protector shown by this company is made long enough to reach to the waist of the user—an important feature. With the addition of ear tabs and chin covering, the woolen garment is supplied with about every feature to add to the comfort of the automobilist while engaging in winter driving. The line of Way mufflers is a very extensive one, but it was shown very effectively in every distinctive shape and weight, and every conceivable color.

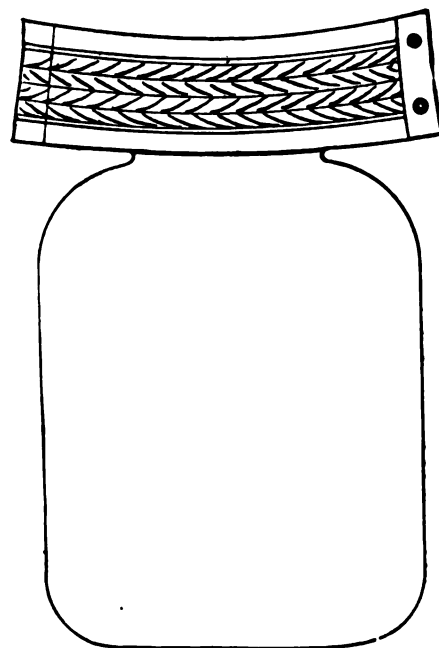
WARNER GEAR CO.—A complete exposition of the equalizing gear of this company attracted much attention. The complete line of Warner sprocket and bevel drives was also shown.

E. J. WILLIS CO.—This supply house had, as usual, a large exhibit, comprising almost everything in the automobile line except a complete automobile. A new specialty is the "Autolog," a speed indicator with a round dial. This has a double-pointed hand, one end of which indicates speed in miles per hour and the other in kilometers; a total and a trip odometer are included, the latter having a separate pointer with dial reading to hundredths of a mile.

WHITLOCK COIL PIPE CO.—At this stand was shown the full 1906 line of Whitlock coolers in the various sizes and shapes as supplied to the leading American car makers. The Whitlock hoods of steel and aluminum in different sizes and shapes were also shown. All the radiators for 1906 made by this company have the first section soldered in a way to strengthen that portion so as to resist the effects of vibration and insure against leakage. Bonnets were also shown, with a lap joint on the side section, so as to prevent leakage from rain upon the working parts of

motors. A display of fans and inlet and exhaust pipes was also made.

THE WEBB CO.—The Webb speed indicator, a very neat and, it is said, accurate instrument, was shown. The trip distance and total distance are indicated to the tenth of a mile, while the speed rate is shown by an index which is lifted by an



WAY MUFFLER FOR AUTOMOBILISTS.

air current passing round it in a taper glass tube. A tiny pump creates an air current whose volume of velocity varies in exact proportion to the speed of the vehicle. While recording the smallest variations, this delicately adjusted instrument is very strong in addition to being weather tight.

WARNER INSTRUMENT CO.—At this company's stand were shown two Warner Auto-Meters, in operation continuously from the opening of the show. They were run by the same electric motor, and had not varied a fraction of a mile in five days in the total mileage registered. Both recorded an average speed of thirty miles an hour during that time. Spectators were much interested in the evident accuracy of the device. A new universal fitting bevel gear drive for the use of this meter on close coupled cars was shown, and American pliable tube is now being used instead of the German article as heretofore.

WHITNEY MANUFACTURING CO.—Four new Whitney chains of the commonly used sizes were exhibited among the rest. These are wider than those made last year and have shorter pitches. It is asserted that quieter running is obtained from the shorter pitch. The Whitney company furnishes manufacturers with blue-prints of sprockets especially designed to fit the Whitney chains.

ORLANDO W. YOUNG.—Oils, soaps and polishes were displayed. The new metal polish, a compound just received from the laboratory, was shown. The ingredients remain in solution readily.

The Automobile Club of Milan, Italy, has started an automobile ambulance service between the city hospital and the neighboring villages. The club has opened a subscription and its members have already contributed a large sum to enable the service to be conducted.—*Exchange*.

STYLES IN CAR BODIES AND FITMENTS.

WHILE the display of bodies at the Garden and the Armory is interesting and also indicative of a wider range of utility for the automobile, it lacks the distinctive features of the 1905 shows. These, as chronicled at the time in *THE AUTOMOBILE*, marked a very important change from the open to the closed or, at least, covered car, and also from the cramped and awkward rear-entrance tonneau to the more graceful and comfortable surrey or double phaeton with doors on both sides. At the present time the covered car and the side-entrance body have ceased to be novelties and have passed into the domain of everyday accepted facts, attracting no special attention. There are but few novelties in body design, and very little difference in type, a few standard forms being accepted by all makers, and, apparently, by the great majority of owners. This is well shown by the uniformity with which the same few elements were displayed on stand after stand throughout both halls; the bare chassis, the chassis with "touring" body, and the chassis with permanently enclosed body. It may be noted in this connection that many of the leading makers have this year limited themselves to a single chassis, of some one given horsepower, to which they will fit any type of body to suit the customer. The actual separation of chassis and body is quite as

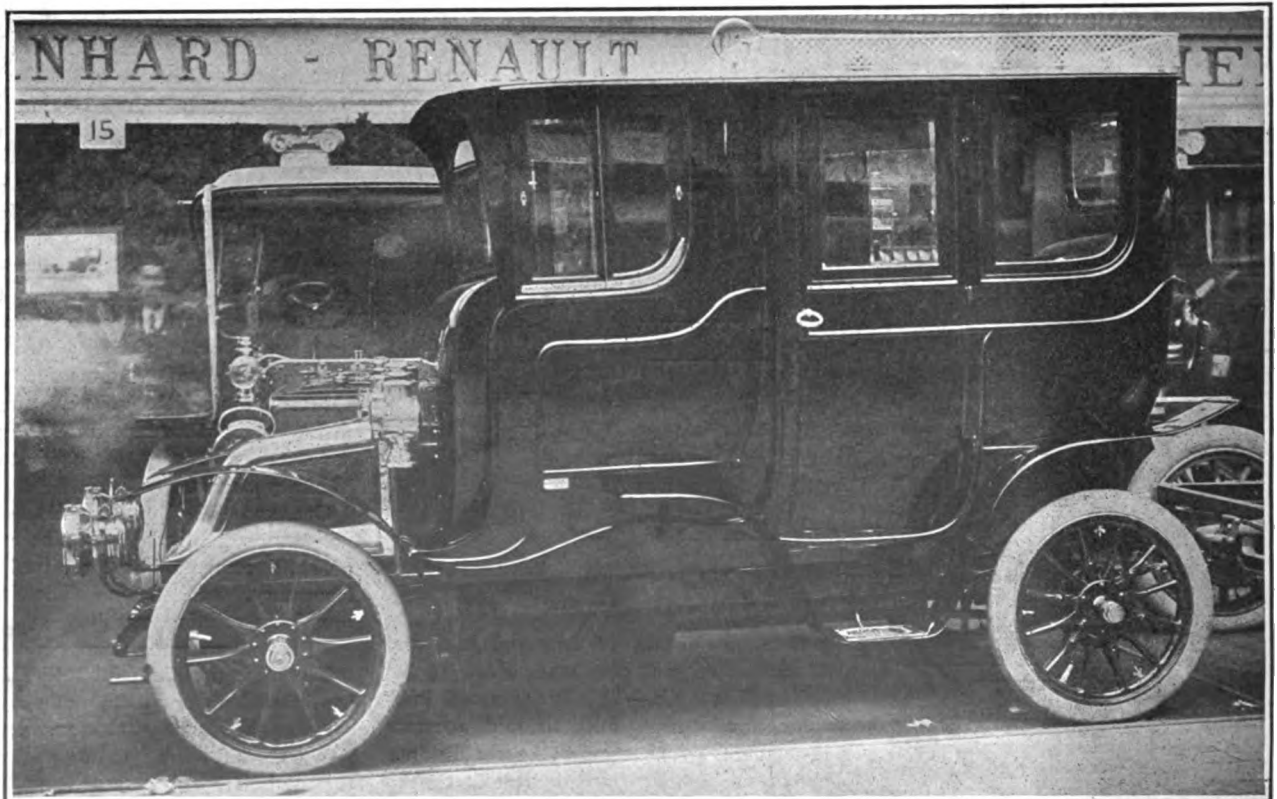
complete as in France, and the old black box with wheels on each corner and more wheels inside is no longer to be found.

Omitting the runabouts and other very small cars, the standard American body is the "touring," with front and rear seats and entrance on both sides, the total length being materially greater than the old tonneau, with a proportionate gain in space for legs and feet and for stowage. As applied to what has been known here as the surrey and in France as the "double" phaeton, the term "touring" is misleading, as a plain, open body is better fitted for short runs by day than for touring in all weathers. If the term "touring" is fairly applicable to any one type alone, the enclosed limousine would seem to be the real touring car, as it, most of all, offers in its integral form and without the aid of attachments those comforts and conveniences which are essential in other than short runs in clear weather. However, the terms in current use are "touring body," as applied to open double-seat cars of the surrey or victoria type; limousine for the permanently enclosed body, and landaulet for the town body with folding top and sides.

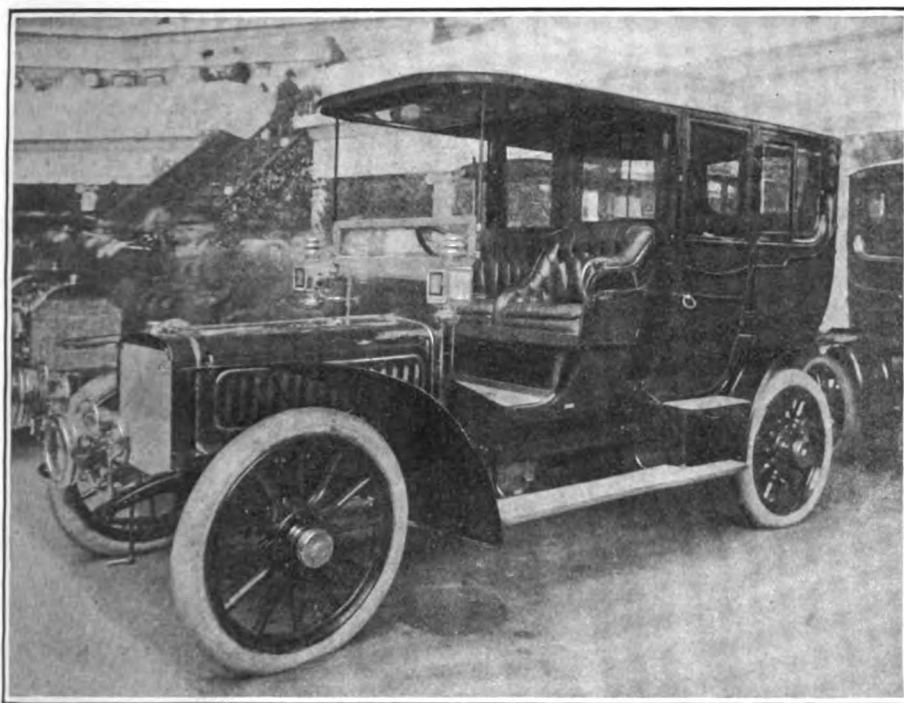
The necessity for a cover, if not for complete enclosure, is now generally recognized, and all the open cars may be fitted with some form of victoria or extension

top of the Cape top, folding back when not in use, the complete enclosure for very bad weather being obtained by means of side and rear curtains. In the completely enclosed limousines the windows are larger and more numerous than last year, with all sashes fitted to open. Many of them drop into pockets in sides, back or doors; in some cases two hinged sash side by side are used, one opening on the hinges, while, if desired, the two together may be lifted out. The idea is to obtain as much light and as good ventilation as possible in the closed body for cold and stormy weather, and in dry, warm weather to remove the sashes entirely, leaving the car open on sides, front and rear. In the landaulets the sashes generally drop, giving plenty of air without folding back the top.

The two shows together disclose a very large collection of good bodies, of both French and American make, but in a comparatively small number of types and with little difference in points of detail. There are fewer freaks than ever before—in fact, none worthy of mention, and there is evident a general improvement in body design in both room and appearance. Where many of the smaller touring bodies of last year were practically if not actually made-over tonneaus, with the cramped foot-room and other disadvantages of the old type, this year there are many well-planned and roomy bodies on the moderate-priced cars.



RENAULT 10-14 HORSEPOWER TOWN CAR WITH LIMOUSINE BODY COMPLETELY INCLOSING PASSENGERS AND DRIVER.



DECAUVILLE TOURING CAR WITH AUDINEAU CONVERTIBLE LIMOUSINE OR OPEN BODY.

The general characteristic of the body design is a greater simplicity and the prevalence of straight-line forms; the Hogarthian and Spencerian lines of beauty are less conspicuous than of old. The exception to this rule is the popularity of the victoria type, with its long, flowing curves, as found in many touring cars. The *Roi des Belges* body is less numerous in point of numbers and less extravagant in form than in former years. The most popular form to-day is the "convex" or "embouti," showing a single convex curve in place of the double reverse of the *Roi des Belges*; apart from the fact that this form gives rather more room on the seat, it is specially adapted to the limousine, as the curve of the lower back sweeps fairly into the upper part of the back.

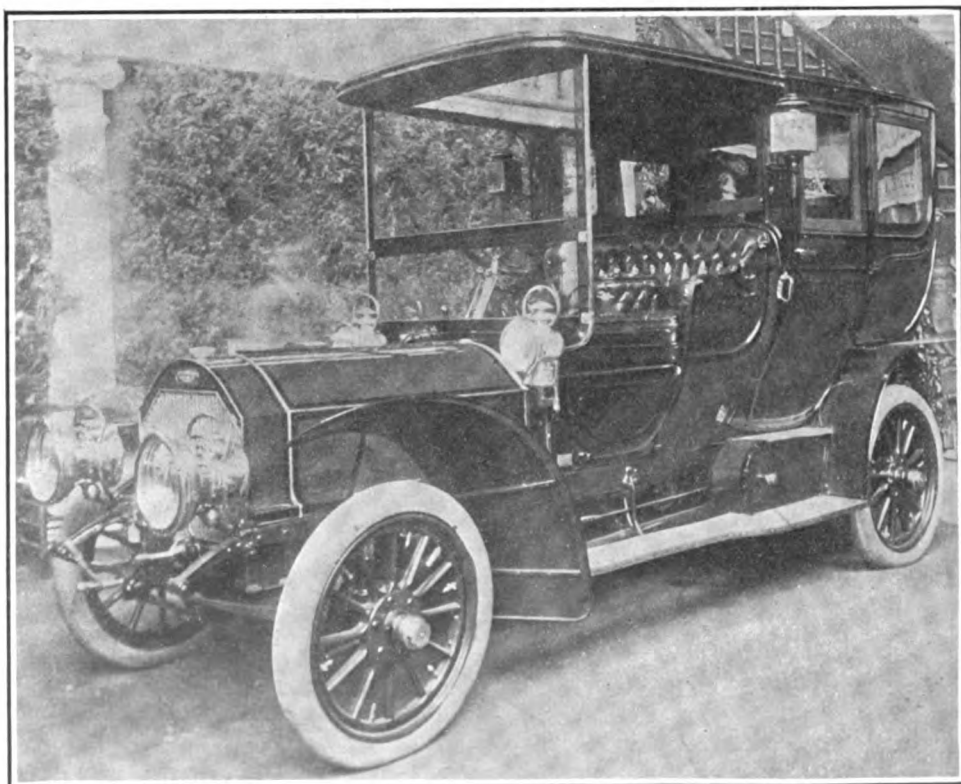
The small and low-priced runabouts are less conspicuous than ever before, not that they are in any way less numerous or less popular, but the same firms which made a specialty of them a year or two ago are now displaying far more pretentious cars—touring, limousine and landaulet. While the runabout trade is by no means neglected, the limited space at the shows is given to the new and higher-priced productions. A very odd development of the runabout idea, not entirely unknown, but reaching new and greater proportions this year, is the runabout body on an expensive and powerful touring chassis. At first sight this seems somewhat of an anomaly; but there are reasons for it. The automobile is coming into more general use as a practical everyday vehicle for travel between home and office over distances of from ten to forty miles, with good road conditions, as speedy and far more convenient than the railway with a trolley ride at one end of the route and a carriage ride of a mile

or so at the other. For this purpose a man does not care to encumber his car with a heavy tonneau which will be empty most of the time, and the plain runabout body with two individual seats side by side in front is preferred.

Another reason may be found among those who have for several years kept open house, so to speak, for their friends, in a large touring car. Such guests as a class are not over-punctual, and the whole sched-

ule of the day's pleasure is often marred at the start by their fondness for still another short nap. The entertainment of a party of four or five involves no small expense in addition to the legitimate costs of running, and in not a few cases such deadhead passengers are lacking in appreciation of the favors conferred. The over-confiding motorist who has for a couple of seasons played the rôle of "Mr. Easy-mark" in his big tonneau is the first to welcome the new innovation, the runabout body for his large and powerful chassis. It gives him an excuse for limiting the size of his party to one congenial companion, and if need be he can have a rumble seat in the rear for servant or chauffeur. Such bodies are shown on chassis of from 18 to 50 horsepower by the Winton, White, Packard, Peerless and other makers.

In the line of large bodies for six or more persons the most conspicuous is the "Overland," built by Quinby, and shown on a Smith & Mabley Simplex chassis. The body is of the convex pattern, with demi-limousine top, sides and back of rear seat enclosed, and top extending for the full distance to front glass. The rear seat, very wide and comfortable for three persons, is supplemented by two fixed individual seats with high upholstered backs, the way to the rear seat being between the other two. The side door is forward of the two seats, and in front are two more individual seats for driver and one passenger. The lower part of the body is finished in black, the sides and back in crimson with black mouldings, and the upholstery is in red leather. The rear sash drops and the single side

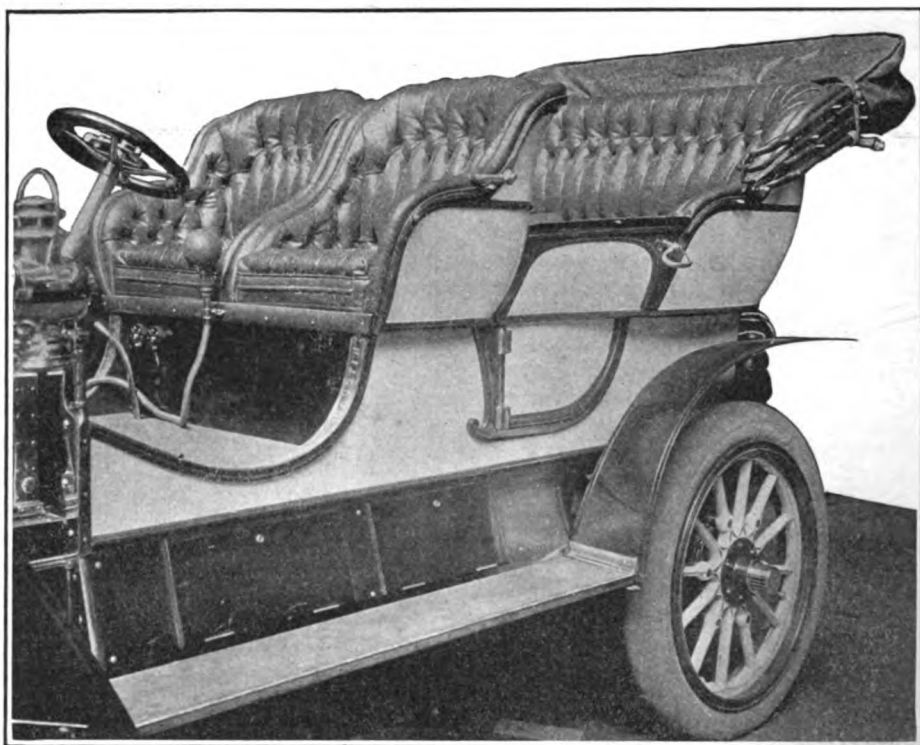


APPERSON BROTHERS' LIMOUSINE CAR WITH KIMBALL BODY. NOTE CARRIAGE SIDE LAMPS.

sashes are removable. Another fine large car seating five in the tonneau was a Fiat, finished in bright red, there being two individual seats disposed in front of the rear seat.

The most perfect combination for all-the-year-round work is found in the two separate bodies, touring and limousine, interchangeable on the same chassis; and, as already stated, the latest limousine may be thrown open on sides and back by means of ample windows. Still another idea is shown in one of the Decauville cars and also in a large Aster limousine. The Decauville body was by Audineau, of Paris, finished in brown, with black moulding and gold stripes. The top was divided from the body proper on the line of the seat tops, being held in place by bolts and notches. Four eyebolts were fitted on the roof, into which slings might be hooked for hoisting, the entire top and sides above the seats coming away. This car was also fitted with two electric side lamps, attached near the roof, and just in front of the door, for temporary use in running at dusk, when it is not desirable to stop to light the main lamps.

The Aster car, of 30-35 horsepower, also by Audineau, was finished in deep red, with black mouldings, the interior in red leather. The break between body and top was along the upper line of the seats, eyebolts being provided for the lifting, the two parts being fastened together by four bolts. The side windows were in two parts, hinged so that one would open, being held by a catch, or the two together could be removed entirely. The usual baggage rail was fitted with two individual front seats and glass front to body with sliding sash in front of driver. Two extra seats within the roomy body were of the theater pattern, with fixed backs and seats folded up; each was mounted on a vertical spindle near the doorpost, being



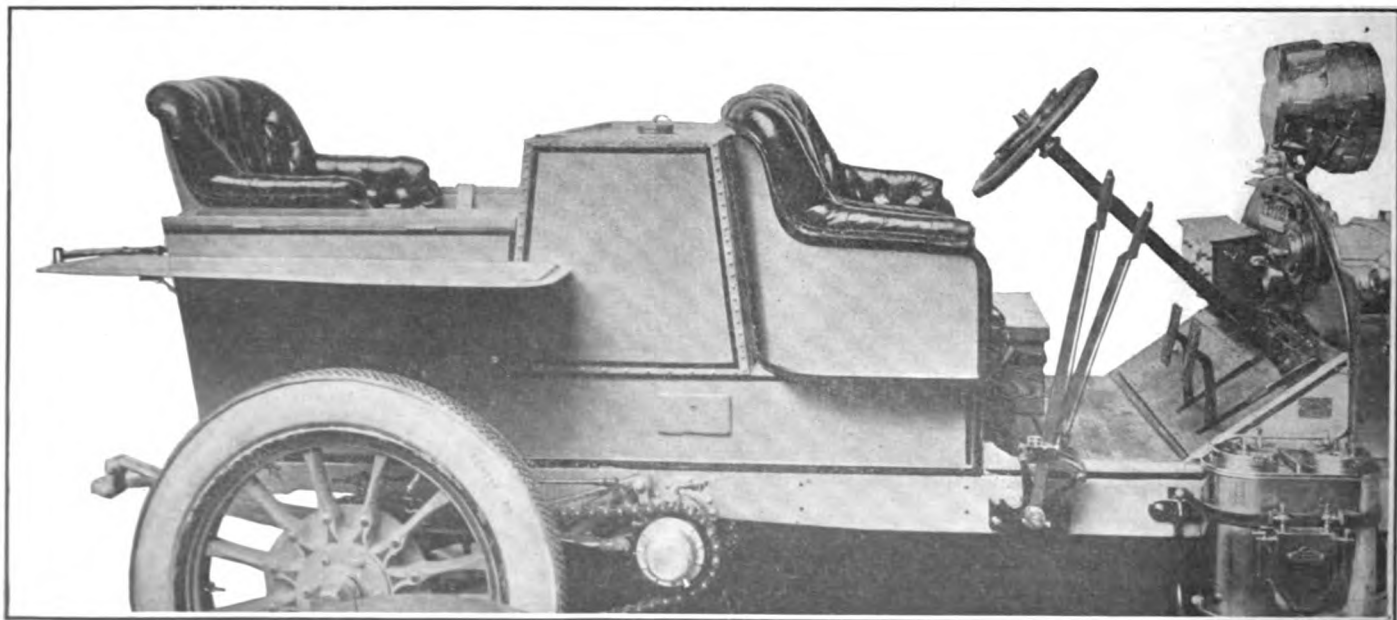
AUSTIN TOURING CAR FINISHED IN WHITE AND BROWN WITH VICTORIA TOP. NOTE SIDE LOCKERS ABOVE RUNNING BOARD.

swung back out of the way when not in use.

It is a difficult matter to select from the very large number of bodies on exhibition, but the following examples will give an idea of the tendencies of the day. A Berliet chassis exhibited by the American Locomotive Automobile Company had a body by Kellner, a landaulet in black with bottle-green vertical stripes, the interior finished in whipcord. The body was attached to the chassis by four bolts, being easily removable when it is desired to change to another form. The interior was very fully furnished, with electric light, annunciator,

speaking tube and small folding writing table hinged downward from the rear of the front seat. The two extra seats, mahogany frame with cane filling, were on spring hinges attached to the rear of the front seats, with sliding metal legs; they could be dropped quickly, and when released swung up against the front seats out of the way. An oblong card table about one foot wide and three feet long, of mahogany, with green baize center, pockets for counters being hollowed out around the rim, could be hung by four straps from hooks in the sides.

Several cars shown last year exceeded in



CLEMENT-BAYARD FAST TOURING CAR WITH FIFTY-GALLON GASOLINE TANK LOCATED BEHIND THE FRONT SEATS.

number and variety of touring fittings those at the present shows; the most complete of the latter being a body by Mühlbacher, on a 50-horsepower Charron, Girardot & Voigt chassis. This was a very handsome landaulet, finished in dark blue, with vertical stripes of a light blue; the interior in *café-au-lait* leather. The wide rear seat was supplemented by two fixed seats with permanent backs, and in addition there were two folding seats hinged to the rear of the front seats. Between these last was an icebox, finished in birdseye maple, and beneath them were two drawers, with birdseye maple fronts, sliding under the front

The American Daimler Company showed a handsome Brewster limousine, with graceful paneling, finished in carmine with black mouldings, the interior in *café-au-lait* cloth. There were two folding seats inside, and the drop sash, two in each side and in each door and the rear, made the body fairly open. A handsome touring body of similar finish was also shown.

The Mors exhibit had two handsome bodies by Demarest, of New York, limousine and landaulet. The same makers were also represented in the Panhard exhibit by a limousine on a long chassis of 24-32 horsepower; the body with maroon

dark green leather, with cloth ceiling to match. The two extra seats folded up against the front. In this same exhibit was a touring body by Mühlbacher, the lower part of the body in black and the door and upper part in dark red with a triple vertical stripe of a brown shade. The back was high, with a wide rear seat, and the doors were specially wide. Two permanent seats with backs were fitted and also a victoria top.

The Rainier Company showed a 30-35 chassis with a large limousine body by Burr, of New York, in Brewster green with black mouldings and fine red stripe;



C. G. V. 25-HORSEPOWER ENCLOSED CAR FINISHED IN GREEN AND BLACK WITH MOTOR UNDERNEATH DRIVER'S SEAT.

seats, for provisions. Two electric lamps were fitted, with speaking tube and whistle and electric ten word course telegraph, the buttons near the rear seat and the annunciator, with ten words showing in red letters by electric light, just in front of the driver. A small electric lamp on the steering post threw light on the driver's clock, oiler, etc. A novel feature, derived from carriage practice, was a shield attached by brackets to the lower part of each door and covering that portion of the running board in front of the doorway to keep the mud from the step. In this same exhibit was a handsome C.G.V. car of 25-horsepower with engine beneath the front seat, a landaulet in green and black.

panels, black mouldings and fine red stripe; the wheels and chassis in automobile red. The interior was finished in whipcord and contained two permanent individual swivel seats. The ceiling was of polished mahogany of fine grain and color, very rich in appearance. The windows were large and of graceful outlines, two in each side, one in the rear and one in each door, all fitted to drop. The space beneath the rear seat was used for storage from the rear; the tool box was under the rear of the body; baggage rail and trunk rack were fitted.

Another Panhard chassis carried a limousine body by Labourdette, of Paris, in dark green with black mouldings and light green stripes; the interior finished in

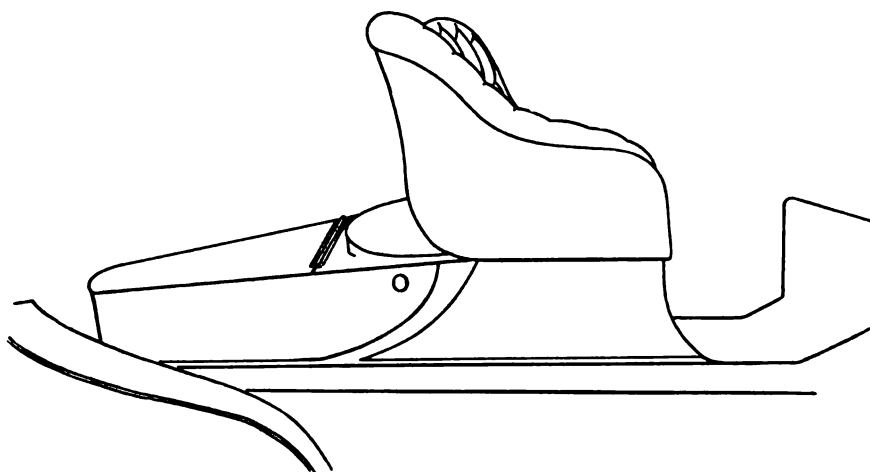
the doors, side and rear panels in imitation canework in white. The rear window was fitted to drop and the double side windows to open or to be removed entirely. The interior was fitted with drop seats, annunciator, lamps and pockets. At the same stand was a runabout in red, with two individual seats, on the 30-35 chassis.

The Austin Automobile Company showed three different bodies—jump-seat runabout, touring car and limousine—each on the 60-horsepower chassis. The runabout had two individual front seats, the space beneath being used for storage, and a folding rear seat with adjustable bronze arms, accommodating two persons. The finish was in olive brown with black mouldings and gold

stripe. The touring car was finished in white with olive brown mouldings, and carried a victoria top. The limousine was finished in olive brown, black and gold. One peculiarity of all these cars was the use of the space immediately under the body and over the running board for stowage. This space was filled in with mahogany, with two drawers on each side for tools, batteries and the side curtains.

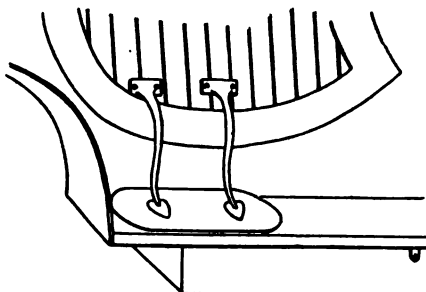
The Smith & Mabley exhibit contained many handsome specimens of body making, both American and foreign, but the most conspicuous example was the all-metal body made by Quinby, on their new system. The body was a limousine, with convex back and corners curved, showing very graceful lines. All panels were of aluminum, joined by mouldings of brass secured from within and brazed at all joints. This concern has abandoned wood in favor of aluminum for automobile bodies, the latest ideas in metal construction being here shown. There is no possibility of water leaking back of the mouldings, and there are no exterior nail-holes to be puttied over. The exterior of the body, just ready for the paint, was shown in burnished aluminum and brass; the interior was finished in light green leather. The rear and side sash were fitted to drop, and the curved sash in the rear corners were removable. A similar Quinby body was also shown in the Haynes exhibit, and another, a demi-limousine, was poorly placed in the basement of the Armory.

A novelty in closed cars was installed in the Smith & Mabley space on Friday, attracting much attention. The chassis was a Renault, with only 10-14-horsepower motor; the body, by Audineau, was a completely enclosed limousine, finished in dark green and black, with interior upholstered in whipcord. The front was extended to enclose the steering wheel and levers, the upper half being of glass. There was the usual rear seat of the limousine and a



RUNABOUT BODY ON HIGH-POWERED CHASSIS, SHOWN ON WHITE STEAMER AND ON VARIOUS GASOLINE CARS.

wide front seat for two, the driver's half fixed and the left half swiveled. The entrance to all four seats was by the side doors, the driver and companion stepping to the front by the swiveled seat. Once



C. G. V. MUD GUARD TO PROTECT DOOR-STEP OF CLOSED CAR.

inside, four persons could be comfortably seated and completely protected from the cold. The windows were large, the side sash being hinged. Smith & Mabley also exhibited a "hansom" body, by Quimby, in

black with red leather upholstery, with double front seat.

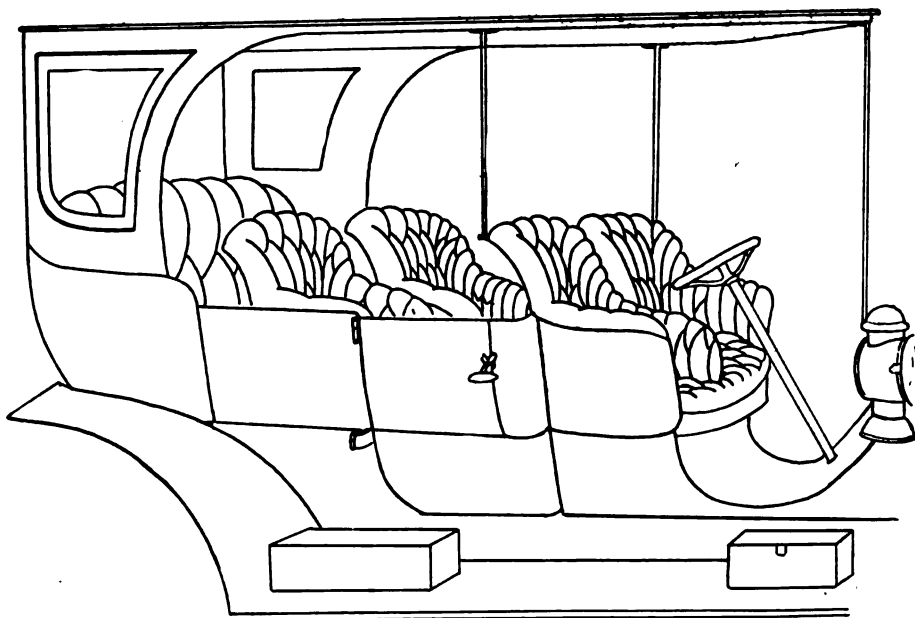
Another attractive "hansom" was shown on a 12-16 Decauville chassis, body by Audineau, finished in blue with light blue stripe, and fitted with inside drive, electric light, etc.

The Locomobile exhibit included a limousine with swelled sides, giving very roomy seats, the body in maroon and the interior in red leather. The two extra seats were arranged to slide forward under the front seats and when closed were covered by a padded leather flap. When drawn out this flap formed the upholstered backs for the seats. A touring body in this exhibit was finished plainly in gray and black, the upholstery being of dark green leather, plain without tufting, making a very rich and elegant finish.

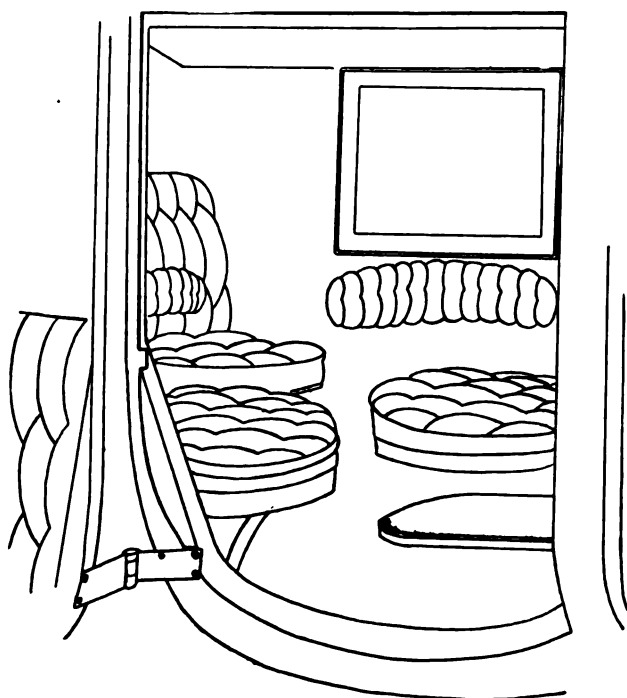
One of the notable limousines was by Kellner, on a Leon Bollee chassis of 45-50 horsepower with 120-inch wheelbase. The style is known as the St. Christopher limousine, with convex body and the rear corners beveled, finished in wine color with black and red vertical stripes. The doors were very wide and the rear seat was fitted to pull forward, making a wide, deep seat for reclining. For access to the top in stowing luggage, a special step was attached to the driver's seat, with a brass handle attached to the roof. On the top of the car was one of the new tire trunks, a circular telescope bag of waterproof canvas on a light wire frame. Three straps of white kid served to close it, and a padlock made all secure for shipment. The case was large enough for several tires.

A variety of the runabout was shown by the St. Louis Motor Car Co. on a 30-horsepower chassis, a victoria seat for two, with victoria top and a long, plain box body in the rear, the car being intended for a doctor or as a fast runabout. The large panel of the side was in yellow, with mouldings in two darker shades.

Last year the extra seats were of a more or less extemporized and flimsy character; while perfection has not yet been reached in this detail, the general construction has



"OVERLAND" SEMI-INCLOSED BODY ON SMITH & MABLEY CHASSIS SEATING SEVEN.



LIMOUSINE BODY WITH SEPARATE FIXED SEATS AND BACKS AND EXTRA SEAT DRAWING OUT UNDER FRONT SEAT.

improved. As already noted, a number of individual seats of the bucket type, with full back, are fitted in the larger bodies as permanent fixtures supplementary to the rear seat. In a number of cases the extra seats slide in under the front seats; in the Bollee limousine already described the upholstered leather flaps which cover the seat when closed forms both back and cushion when the seat is drawn out for use. In one Rothschild body a small seat for a child pulls out from the center of the rear seat. In another body by Boulogne a child's seat

folds up when not in use into the rear of the front seat. In some cars the extra seats are of the jump-seat variety, folding forward and down, and the legs lying flat on the floor.

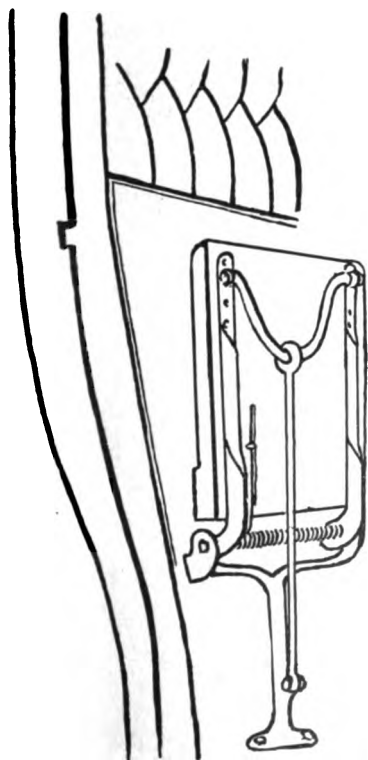
Last year, in addition to the touring body, samples of closed bodies were shown by many American makers; this year every standard American make has at least one good closed body in its exhibit, and sometimes several of different types or finish. Some of these bodies are built in the home shops, but a very large number are the

work of body specialists—former carriage builders in different sections of the country. As many of the completed cars sell for a price that would not buy an imported chassis, it is not to be expected that the work on the bodies is equal to the highest, but to all appearance it is good of its class. One need no longer buy a foreign car in order to obtain a closed body, as these can be had of American make in the moderate priced as well as the more expensive cars.

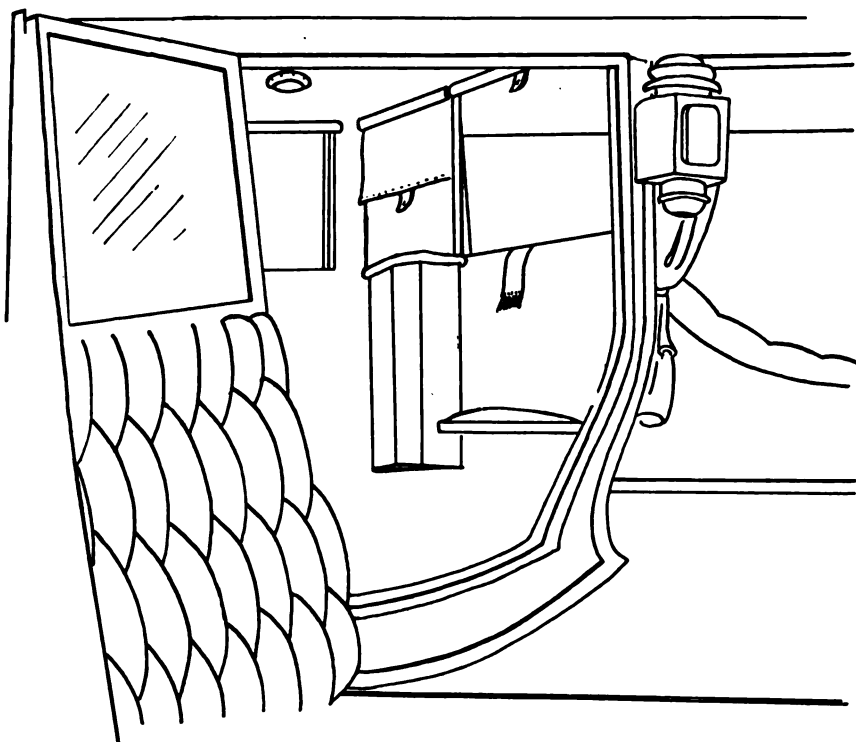
In the matter of color there is a pleasing absence of the loud and garish, and a variety of good standard carriage colors in the usual combinations of maroon, carmine, dark greens and blue with black; the distinguishing firm colors of bright yellows, blues, greens and red, a survival of old bicycle days, were much less in evidence than ever before, the general finish being after good conventional carriage lines.

From such evidence as the Garden and the Armory offer, it would seem that the development of the perfect automobile body is only a matter of time and of good taste and judgment on the part of the users. Much has been learned from France in the direction of new styles and special adaptability to automobile as distinguished from carriage uses, as well as in structural details; and on the other hand all the skill and taste of the American carriage builder have been diverted into the new field.

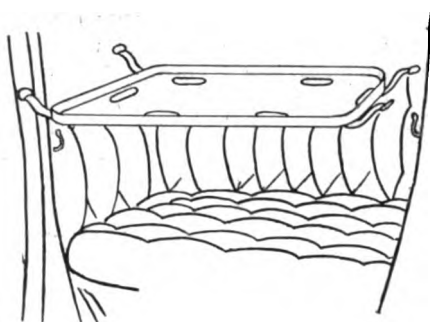
The leather side curtain to the side openings in front of the driver's seat have been in vogue for several years, but this year they are replaced in a number of instances by low-hinged doors, completely enclosing on the sides the foot room of the front seats and adding greatly to the comfort of the driver and his companion in cold weather.



FOLDING SEAT CLOSED BY SPIRAL SPRING.



INTERIOR OF ST. CHRISTOPHER LIMOUSINE SHOWING EXTRA SEAT TO DRAW OUT AND CABINET.



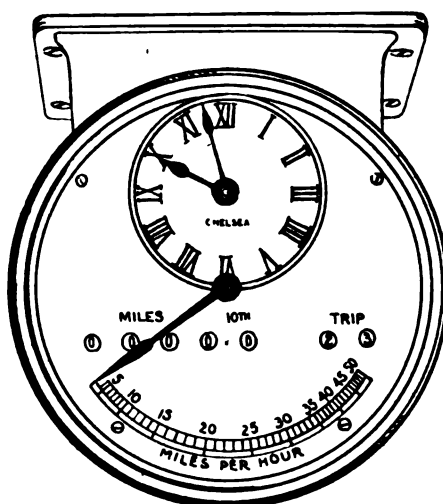
BERLIET DETACHABLE CARD TABLE.

There was noticeable last year a new attention to detail in the fitting up of cars of various classes, in particular the closed touring bodies, every available space within or beneath the body being utilized for some special stowage of tools, tires, ice, luncheon, clothing and the like, and many minor conveniences in the line of pockets in upholstery and on doors, hidden mirrors and cases for toilet articles, cases for writing materials, and similar devices being added. The cars of this year are similarly equipped, but there are no special novelties over last year.

In the way of entrance the running-board for the full distance between front and rear fenders is even more common than last year, but few separate steps being seen on the touring cars. A typical exhibit in this line is the Q. & C. Stanwood steel step, made of thin strips of Bessemer steel, crimped and on edge, somewhat similar to the metal doormat. As a substitute for the wooden footboard with rubber tread this new device

is light, strong and very durable, while it acts as a foot scraper and mat and avoids the common danger of slipping when the step is icy or wet. It is made both as an individual step and as a continuous foot-board, and fitted to many cars as a part of the stock equipment. An extra step high up on the side is seen on a few limousine bodies, to give access to the roof for stowing the luggage. A novelty in automobile practice, though old in carriage work, is the mud guard already mentioned, attached to the lower edge of the door and keeping clean the step to the rear body; this is shown on but one car.

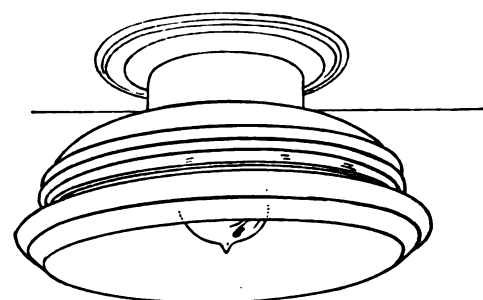
The exhibit of odometers, tachometers and other time- and space-measuring instruments is larger than usual, the well-known Jones and Veeder machines, both in improved form, being supplemented by some



LEA SPEEDISTIMER WITH CLOCK.

new makes. The Lea Speedistimer is a trip and total odometer of the mechanical type combined in a single fixture with a Chelsea auto clock; the upper part of the circular dial showing the time, the lower part the rate of speed, and, between the two, odometers for season and trip, all measurements being in miles. The McGiehan Speedometer is also mechanical, driving from the wheel by flexible shaft, the instrument being rectangular in face, with trip record at the top, season record just below, and the speed register at the bottom, a hand and graduated scale giving the speed up to 60 miles per hour. The simpler forms show season and speed, season and trip, or the total season mileage alone. The Hick Speed Indicator Company shows two forms of instrument, both mechanical with flexible shaft drive. One of rectangular form shows the season, trip and speed to 50 miles; the other, of circular form, shows season and trip mileage only.

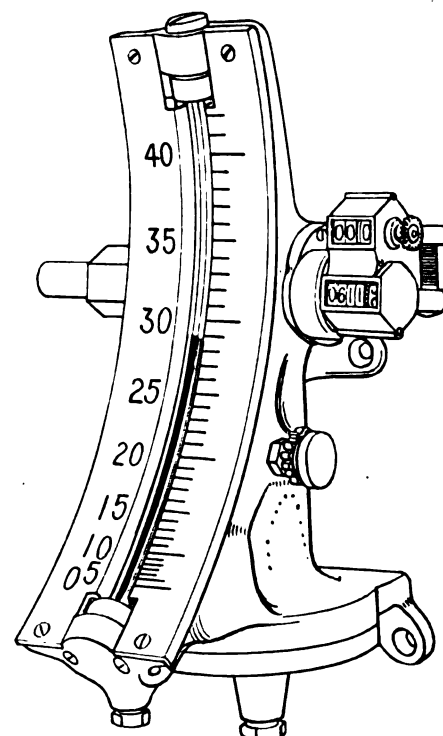
The Webb speed indicator is on a different principle from the circular scale and swinging hand; the scale is vertical, and similar in appearance to a thermometer or steam gauge, very legibly graduated with horizontal black lines for the units (miles)



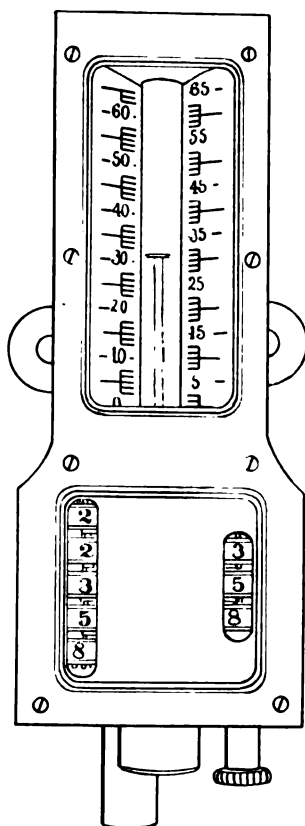
ENGLISH AND MERSICK INTERIOR LIMOUSINE DOME LAMP.

and red figures to right and left for every fifth mile up to 65. Between the two columns of graduation is a glass tube of taper form, within which floats the indicator, of but five grains weight and showing in the tube as a heavy black line. A small air pump driven by flexible shaft from the wheel forces a column of air into the tube, the indicator floating on this column at a height proportionate to the pressure of the air. In the lower part of the case are two odometers, showing total and trip mileage.

The Hopkins autolog is of the mechanical type with flexible shaft drive and circular index plate, but the hand is double and the dial has a double graduation, miles in the upper semicircle and kilometers in the lower. A glance at the upper end of the arm shows the speed in miles, while the lower end shows the speed in kilometers. Total and trip mileage are also shown in the center of the dial, the trip odometer being provided with a special timing hand, revolving once for each mile, by which the separate miles may be timed with a watch. The speedometer is graduated up to 60 miles and 100 kilometers. A separate form is also made, the speedometer alone, without the odometers.



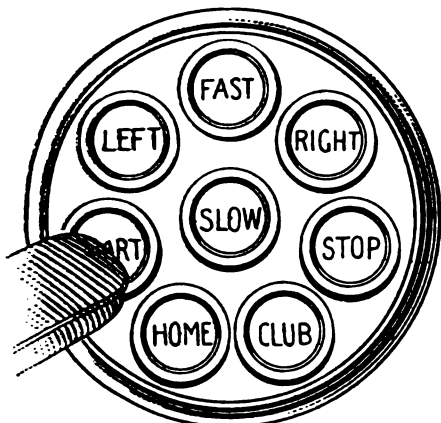
VEEDER TACHODOMETER.



WEBB COMBINED SPEED, TRIP DISTANCE AND TOTAL DISTANCE INDICATOR.

The Esco speedometer, made in France, is of the electric type, the main part of the instrument being a small magneto attached to the steering knuckle and driven by a rubber belt from a large grooved rim attached to the spokes of the front wheel. The indicator is a circular dial in a metal case, attached at any convenient point and wired to magneto, the hand showing the speed in kilometers on the curved scale.

The Monitor speed recorder is also an electrical device, more costly and complicated than the usual automobile indicator, being primarily intended for marine, stationary and pumping engines of large size.



JONES AUTO ANNUNCIATOR—DIAL INSIDE CAR.



JONES AUTO ANNUNCIATOR—DIAL IN FRONT OF DRIVER.

It gives the speed and the number of revolutions, recording on paper. It may be used on an automobile.

The auto clock is shown in various styles, with the plane and convex glass; the silvered face with each figure on a large black disk is the most legible by night. A special form of timing clock, with stop and fly-back, is shown.

The devices for producing noise of a more or less musical character in quantity are more numerous than ever before; to the improved varieties of the plain auto horn being added the chimes and the siren. The plain bulb horn with flexible tubing is now supplemented by several makes of electric

horn. In addition to a small battery and the wiring, the apparatus consists of a small attachment containing a diaphragm and electric sounder, to which the horn may be screwed after the reed and piping have been disconnected. Push buttons in any desired number may be placed about the car, thus putting the horn within reach of any of the passengers.

The sirens are shown of various makes, but all effecting the same end of unintermittent, unlimited, unmusical mechanical noise. The Gabriel horn is shown in an enlarged form with eight elements controlled by keys, on which an air may be played after the fashion of chimes.

The King auto lorgnette—a leather frame about six by eight inches with handle like a fan, the upper half being filled with smoked

celluloid and the lower with the clear—is used to shield the face from the wind and the eyes from dirt and glare; it may be used as a fan, and a small metal hook on the upper edge serves to hold the hat on. A wrist strap is provided to guard against loss. Another odd motoring novelty is a folding hairbrush, with detachable mirror, the whole about the size and shape of a pack of cards. It may be noted that no genius has yet devised a practicable dust brush, to be driven by electricity, or an exhaust dust extractor for the clothing using compressed air.

Leather and canvas mailbags and similar articles are shown by Boyle, also a variety of automobile trunks and hampers, including special lines for certain makes of cars; with these are the leather license pad and the leather tool kit.

Air-Cooled Cars at the New York Shows.

LAST year the Garden Show introduced to the public a considerable number of novelties in air-cooled construction, notably the Frayer-Miller, Marion, Marmon and Corbin cars and the four-cylinder Waltham-Orients, all of which were then seen in New York for the first time. This year, on the contrary, at the New York shows there are no striking novelties whatever in this line, and practically all of the changes from last year consist in improvements of detail or enlargement of cylinder sizes. The only marked departure from lines established a year ago is seen in the new four-cylinder Knox, which has already been described in these columns. The cylinders of this car are of 4.3-4-inch bore by 5.1-2-inch stroke, and have the characteristic Knox porcupine construction. Owing to the length of the pins on the cylinders, the latter are spaced a considerable distance apart, making engine long in a fore-and-aft direction, a fact of which advantage is taken to provide unusual wearing surface on the crankshaft, which has five bearings. The cylinders are cooled by a five-bladed fan about 17 inches in diameter, and the toe-board is made sloping, to give the air as free an escape as possible. The cylinder heads alone depart from previous form, being cast with vertical ribs and no pins. The valves open directly into the cylinder heads and are operated through rocker arms, there being two camshafts. The valve cages are removed by unscrewing threaded bushings which hold them down. The effective diameter of the valve opening is 2.1-4 inch, and the compression is stated by Mr. Jones, the designer, to be 55 to 60 pounds per square inch. The engine is geared to run 1,000 r. p. m. at about 45 miles per hour. Lubrication is by splash, oil being taken by a pump from the bottom of the crankcase and delivered by a branched pipe to the main bearings. In the second and fourth of these bearings the oil enters the crankshaft through drilled passages to the crankpins.

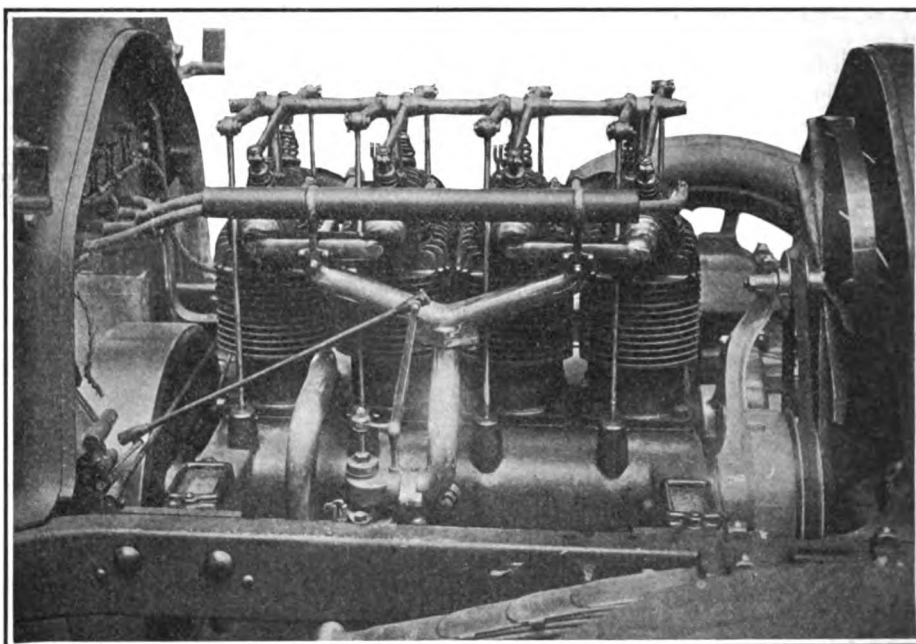
The car most nearly resembling the Knox is the Corbin, which, in fact, is partly the work of the same designer. Last year there were two sizes of Corbin cars, one rated at 16-20 horsepower and one at 30-35 horsepower. In both the Corbin cars the cylinders are cooled by an air current passing over a series of combs, as they may be called, stamped out of the sheet steel and forced into grooves in the cylinders with their teeth projecting. In the larger engine last year these grooves were vertical, but this larger model has been discontinued, and the 1906 16-20-horsepower car has circular grooves, as last year. This, of course, gives greater strength to the cylinder walls to resist the diametrical stresses due to the explosions, which are greater than the longitudinal.

The cylinder heads are separate from the cylinders and have ground joints. The elbows which form the intake and outlet for the gases are integral with the cylinder heads, and the valves seat in cages dropped into these elbows and held, as in the Knox. The compression is understood to be about 40 pounds cold-gauge test. The crankshaft is quite long and has long bearings and the crankpins are oiled, as in the Knox. An unusual feature of the engine is the use of Hess-Bright ball bearings for the ends of the crankshaft, though the three intermediate bearings are plain. The oil is fed by a pressure pump to a row of sight feeds on the dash, and thence by separate pipes to the cylinders and crankshaft bearings. The bore and stroke are each 4.1-4 inches.

The Marmon motor is not essentially changed from its form of a year ago, save that the cylinder sizes have been increased from 4 by 4 inches to 4.1-4 inches bore by 4-inch stroke for one size of motor and 4.5-8 inches bore by 4.1-2 inches stroke for the other. In the smaller motor the net valve diameter is 1.5-8 inch; in the other it is 1.7-8 inches. The cylinder heads are integral with the cylinders and the valves

seat in elbow castings which seat gas-tight in the cylinder heads. The heads themselves are cooled mainly by the same ribs that cool the walls, and no attempt is made to add ribs to the elbow castings. All the valves are operated by rocker arms from a single camshaft, and the V-shaped arrangement of the cylinders used last year is retained. The compression is about 30 pounds cold-gauge test, and the maximum engine speed under load is 1,900 r. p. m. The engine is cooled by a 17-inch, 8-bladed fan geared 2 1-2 to 1 from the engine. As before, lubrication is by force feed from the bottom of the crankcase, through a stuffing box at the front end of the crankshaft, and through passages drilled almost clear through the shaft, distributing oil to the main and crankpin bearings. The outlet holes of the crankpins are directed toward the axis of the shaft instead of radially outward, it being found that this gives a better distribution of oil, as the oil does not have to issue against the pressure on the working side of the crankpin bearings. It is, of course, at once carried around to the working face by capillary adhesion as the shaft revolves. An oil hole is drilled in the center of the pressure half of the crankpin bearing, but it serves a more logical function than the oil hole located at that point in many other engines, since a tube runs from it to the wristpin bearings, and the oil travels upward through this tube, being forced by the pressure on the bearing during the working stroke.

The Premier car of last year, with four-cylinder transverse engine having a bore of 3 3-4 inch and stroke of 4 1-4 inches, is continued this year practically without change. A new car has been added, however, with bore and stroke each 4 1-2 inches, and this motor is located fore-and-aft and cooled by an eight-bladed fan, aided by fan-blade spokes in the flywheel. There are two camshafts, and the push-rods on either side op-



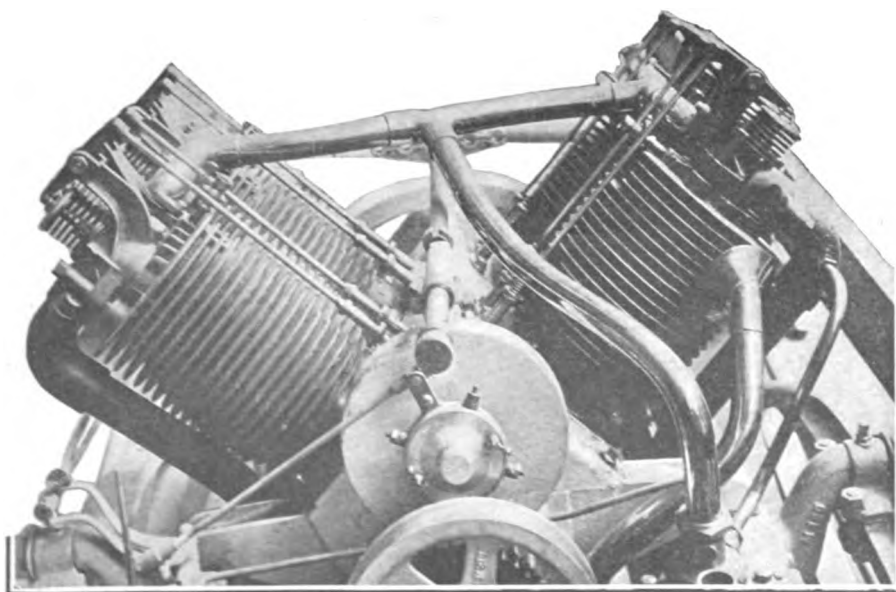
MOTOR END OF PREMIER AIR-COOLED CHASSIS SHOWING OVERHEAD VALVE ARRANGEMENT.

erate the valves on the other, through long rockers, thus avoiding the sidewise wear on the valve-stem bushings which is unavoidable with short rockers. The valves slant slightly and open directly into the cylinder heads. The inlet and outlet passages are elbow-shaped, as usual, and are cooled by fore-and-aft vertical ribs. Lubrication is by a four-feed Hill oiler, which mechanically distributes oil by separate pipes to the cylinders. The oilpan of the crankcase is partitioned into four compartments, each with its own level cock for trying the level of the oil. If the oil supply is not sufficient, additional oil is poured in through gauze strainers in the wings which support the motor, these being cast hollow and in communication with the crankcase. As the partitions below run only up to the normal oil level any oil added at one point will dis-

tribute itself properly. The cylinder walls are cooled by wide flanges, slightly shortened at front and back to reduce the length of the engine.

The Marion car is distinguished, as before, by the form of its cylinder flanges, which are not deep nor especially thin, but are machined to a smooth surface, this being claimed to facilitate the movement of the air currents. The engine has four separate cylinders and is cooled by a 17-inch 8-bladed aluminum fan. The toeboard is sloping, and the flywheel has fan-blade spokes. The cylinders are 4 1-2 inches bore and stroke and the inlet valves work in pockets at one side. The special feature of the engine is the large size of the exhaust valves, which open directly into the cylinder head and have an effective diameter of 2 inches. The exhaust pipe also is of large diameter, about 2 1-2 inches inside, and the header connecting the valve chambers with it has branches of easy radius, and increases in diameter from front to back. The compression is stated to be about 40 or 45 pounds cold-gauge pressure. The exhaust valves are opened by direct downward pull from the lower side of the camshaft, instead of by rocker arms as usual, thus reducing the noise. Over each exhaust valve is a sort of bulb-shaped expansion chamber, through which the valve stems are carried. Lubrication is by splash, and the pistons carry extra rings at the lower ends to prevent an excess of oil from going into the combustion chamber. An oil tank at the side of the crankcase admits oil through independent hand-operated needle valves to compartments at the bottom of the case, and glass sight gauges indicate the oil level in the compartments. The maximum speed of the engine is about 1,800 revolutions per minute.

The Aerocar, a newcomer from Detroit, follows conventional lines in all respects. The engine has four vertical cylinders cooled



INCLINED CYLINDERS OF MARMION 4-CYLINDER AIR-COOLED MOTOR IN THE CHASSIS.

by horizontal ribs, and the valves open directly into the cylinder head and are operated by rockers, as usual. They have an effective diameter of 1.7-8 inches, and the cylinders, which are 4-inch bore and stroke, have integral heads chambered out slightly to accommodate the valves, as the sum of the outer valve diameters is a little more than the diameter of the piston. All the valves are mechanically operated. The engine speed is stated to be rather low—about 1,000 r. p. m. at the maximum speed of the car on a level road. Lubrication is by splash, and a large 6-bladed fan in front assists the draught.

The Franklin motors have already been fully described in these columns. They embody no new features for the coming year, although some radical improvements have been made elsewhere in the car. The compression of the Franklin motor is understood to be about 65 pounds cold-gauge, and the piston exhaust which distinguishes the Franklin among air-cooled motors is retained.

The same retention of well tried design as regards the air-cooling system may be said of the Waltham-Orient cars, which are made in identically the same cylinder sizes and general form as last year.

The Frayer-Miller motors, which, as is well known, are cooled by a direct blast of air through air-jackets surrounding the cylinders, have been changed only in a few details. The number of pins cast on the cylinder walls has been somewhat increased, especially on the cylinder heads, and the horizontal pipe carrying the air from the

fan to the cylinders has been widened slightly at the front end and narrowed at the rear, to give a better distribution of the air. The fan has been entirely changed and is now of the so-called "Sirocco" form. The blades are very short, measuring only about one inch radially, and their outer tips are bent forward in the direction of rotation. This is exactly the opposite of what would be expected, but it is found in practice that the efficiency of the fan thus constructed is fully double what it would be if the blades were bent in the contrary direction. The

opening of the air intake is very large, being practically the full diameter between the roots of the blades, as it is found that a smaller opening "strangles" the air current. The speed of the fan is about 2.1-2 times the speed of the engine, or a little slower than before. The fanshaft runs in Hess-Bright ball bearings located above the crankshaft, so that as the latter wears down in its bearings the gear teeth driving the fan cannot jam together. Fan-blade spokes in the flywheel assist the draught materially.

1906 Frame and Spring Construction.

THE intermediate means between the power plant and body on one hand and the wheels on the other are the frame and the springs, which are nearly inseparable in duty, and therefore construction, and form the elements of automobile suspension.

The main object of suspension is a correct relative placing of the constructive elements which shall either be unalterable, forming a rigid connection, or alterable under stress, forming a flexible, usually elastic, interaction.

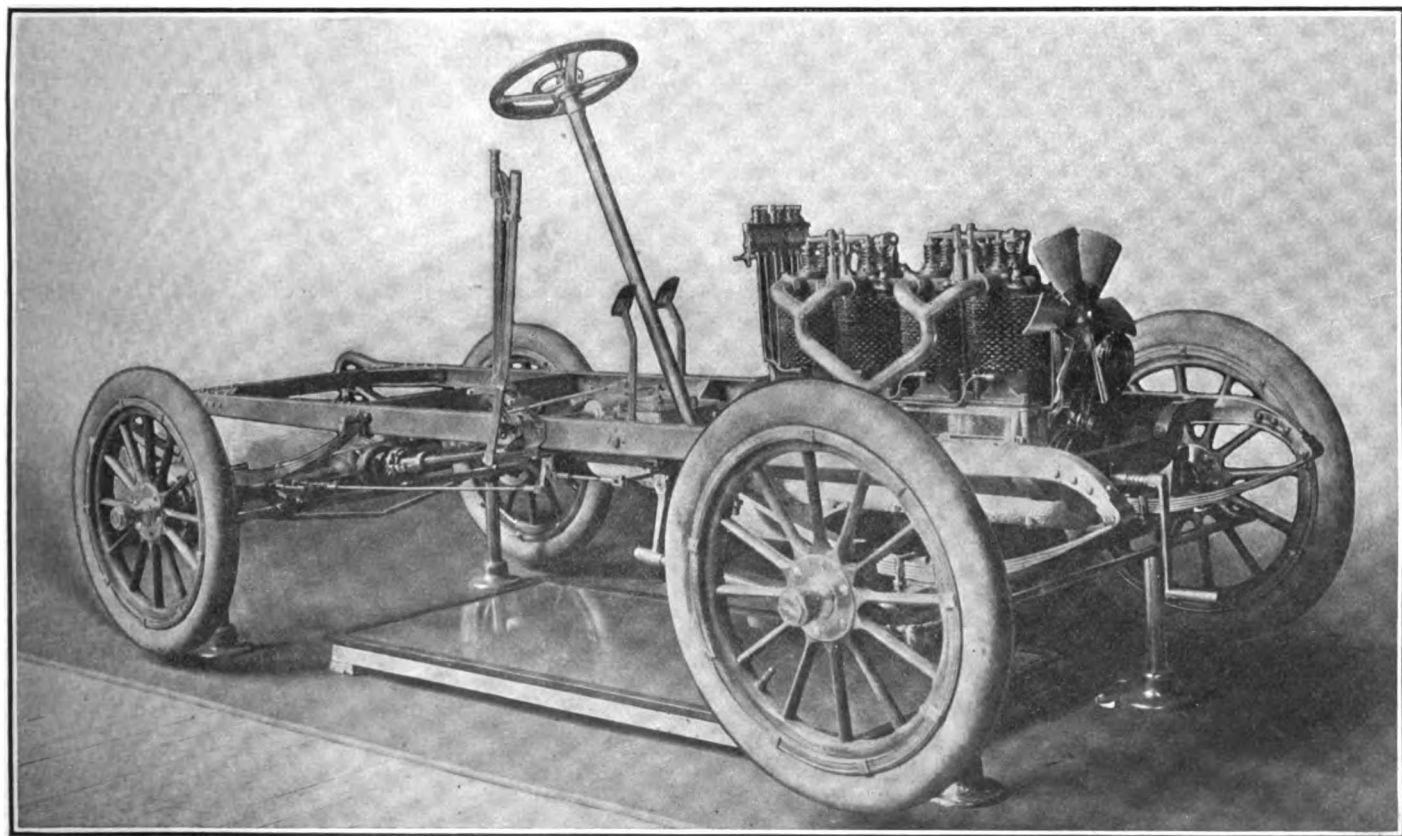
Rigidity was, up to this year, the paramount, universally approved condition for the power plant, and therefore also for the frame construction as the direct supporter of the same.

But it must be mentioned that several prominent makers, mostly of foreign cars, have for a considerable time manifested

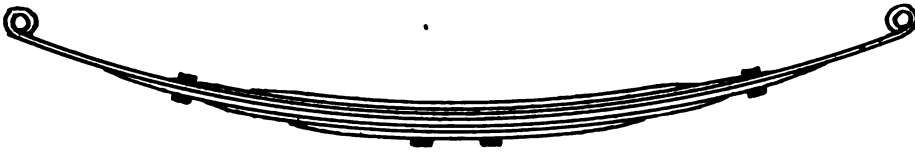
their belief in more or less flexible frames, as shown by the nature of their frame construction. In this country, however, stiffness of frame to the utmost possible limit of weight was the general rule up to last season.

The introduction and admirable development of the steel frame fathered this principle, and the historian finds, especially in early constructions, extremes in one-piece frames and designs of cross members and sub-frames, the advantages of which were never in keeping with cost and weight, and furthermore, they never completely responded to the duties they were expected to fill.

The abolition of the rear-entrance tonneau and the introduction of the side-entrance body called for considerably longer wheelbases. Frames, and especially side



CHASSIS OF THE CORBIN FOUR-CYLINDER AIR-COOLED SHAFT-DRIVEN TOURING CAR EXHIBITED IN THE ARMORY.



HEWITT CAR HALF-ELLIPTIC SPRING WITH THREE GRADED LEAVES BELOW THE MAIN LEAF AND TWO ABOVE.

members, had, therefore, to be increased in their dimensions, especially those subject to vertical stresses.

The result was twofold and of rather unexpected character. It was found that a longer wheelbase added to the comfort of riding in reducing vibration, which pointed directly to the advantages of an elastic frame. The increased frame length brought roomier, and thereby heavier body construction, calling for heavier springs, which—manufactured under old rules—were of rather uncomfortable stiffness. On the other hand, such inroads on the stiffness and rigidity of the frame seriously affected the efficiency of the power transmitting devices, constantly throwing them out of line.

Although the change in frame and spring construction is under the rather slow in-

The reaction of the flexible construction of power drive on frame construction was in some cases immediate, as shown by the several wood and wood armored frames of American derivation.

Of prominent foreign firms, the C. G. V. compound frame may be mentioned as rather of unusual prominence. The principle of construction is similar to a box frame, with fishplate reinforcements, but in practice radically different from any other make. The side member as well as front

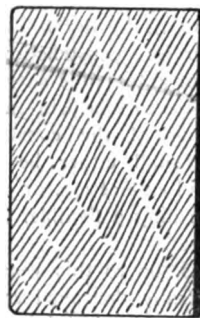
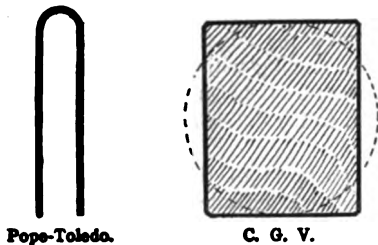
first. The actual method is as follows: A second growth hickory or accacia round pole, thoroughly soaked in olive oil, is driven into a seamless steel tube and afterwards rolled to rectangular shape by hydraulic pressure.

It is claimed that this frame combines elasticity and strength superior to any other frame construction. As data on the practical performances of such frame construction are rather scarce, the correctness of this statement is only supported by the sound theory embodied in such design and by the beautifully correct details of other parts of this 75-horsepower chassis.

The side members of this year's Pope-Hartford chassis show a wooden sill with a vertical flat steel reinforcement on the inside. The same construction is shown in the frame of the Lansden electric truck.

This year's Panhard construction shows the combination of a regular channel section pressed steel frame with an ash sill on the outside of somewhat peculiar relative proportions.

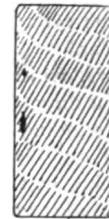
The parallel employment of wood and steel is also shown on the C. G. V. truck



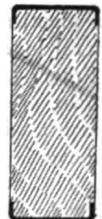
Pope-Hartford.



Panhard.



Franklin.



Lansden.

SPECIAL FRAME SECTIONS.

and rear cross members are of identical section, showing a seamless rectangular armor enclosing a wooden sill, the manufacturing possibilities of which are rather baffling at

chassis, where a simple wooden frame of rectangular section is arranged on top of a composition frame, as before described.

On light weight vehicles we find a wooden frame on the Lansden electric runabout with very light angle iron armor and an unarmored wooden side member on the Franklin runabout.

The frame construction of the Orient buckboard, although being entirely of wood, stands in a class by itself, as its flexibility is in harmony with the principles of buckboard construction and without influence upon the power drive.

fluence of a trial and error process, each step of which is a period of nearly one year, and although the influence of frame and spring makers is usually of a conservative character, the frame and spring constructions of this year show some very interesting, although still diverging, tendencies.

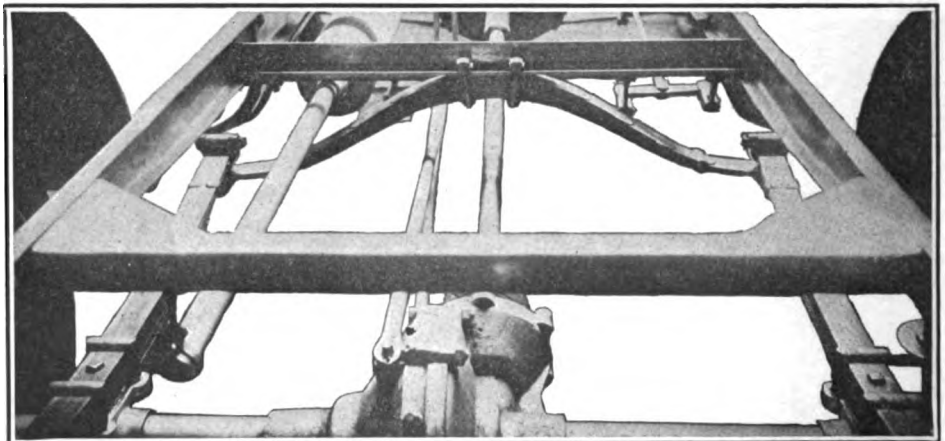
The unquestionable loss in rigidity of frame construction brought forth several chassis designs of very bold conception.

The three-point suspension, an old desideratum in automobile construction, has found more general application in 1906 cars.

The much admired C. G. V. chassis shows a pure and well balanced design of a three-point suspension, the three points being formed by the two end supports of the rear axle and the swivel connection of a rather heavy engine base of horseshoe form with the front cross member of the frame.

The Stevens-Duryea is another example of a well arranged three-point suspension, with the added characteristic of absolute rigidity of drive up to the end of the transmission shaft.

The arrangement of a universal joint between clutch and transmission, the absence of which is this year as much an exception as it was a rule last season, is another manifestation of the independence of the designer from frame rigidity, or rather of the decisive influence of frame flexibility on drive construction.



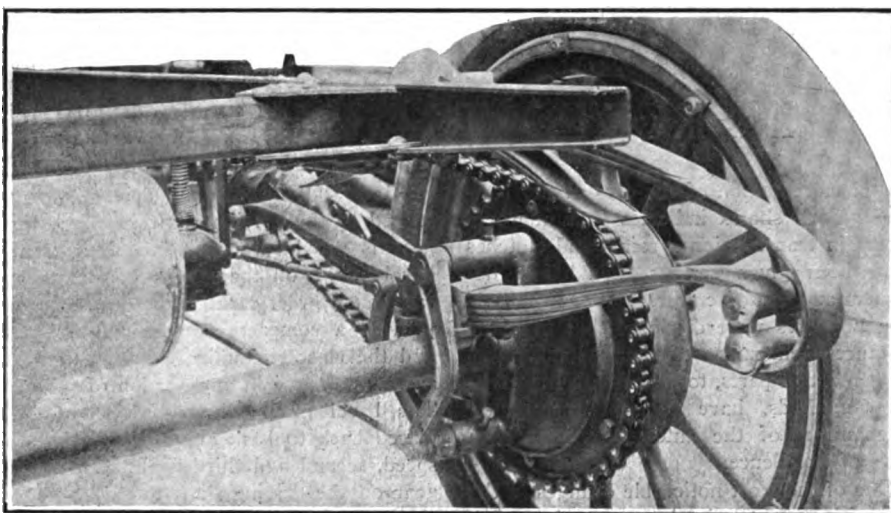
PLATFORM REAR SPRING SUSPENSION OF ST. LOUIS CARS. NOTE TRANSVERSE SPRING IS SHACKLED TO FRONT ENDS OF SIDE HALF ELLIPTICS.

The coming season will probably furnish valuable data on wood armored frames, which might be valuable information for the designers of next season's cars. The majority of frames, however, are still of the channel section, pressed steel type, with a deepening of side members as a characteristic. There is also a noticeable increase in the use and dimensioning of under bonnets, constructed in one piece or structurally united with the frames.

The influence of heavier bodies, as before mentioned, but to a great extent also, the increase in vehicle speeds, necessitated special care in spring design and selection of material. Complaints in the past about spring stiffness were too numerous to be neglected, and the spring makers found that their years of experience in the manufacture of carriage springs did not quite cover the conditions governing the production of automobile body springs.

This year's models show the efforts of the designer to increase the combined length of synchronous acting spring arrangements, as well as the tendency to eliminate to the utmost possibility any strains on the spring elements other than pure compression.

The standard disposition of springs seems still to be the ancient half elliptic spring, although the length of such springs has been universally and materially increased—the average length being 50 inches for the rear and about 42 inches for the front springs. The leaves themselves have not any more the standard width of 1 3/4 inches, but are usually 2 to 2 1/2 inches wide, and in some



DOUBLE ELLIPTIC SPRING OF THE MARION CAR WITH AUXILIARY SPRING LEAVES UNDER THE UPPER HALF.

instances thinner and "graded." The heavy set that spring leaves usually had seems, happily, to be on the wane and the double shackling of rear springs the rule. It was observed that, in the Léon Bollée the front half of the rear spring acts as a distance rod, its front end being provided with a generous proportioned pivot and the spring seats, naturally free on the axle.

A peculiar spring construction is also shown on the Marion car—a full elliptic spring in front with an auxiliary spring leaf on the upper half and only contracting under heavy compression. The same principle is applied to the compound spring in the rear.

The use of the three-quarter elliptic

spring for the rear is shown by several prominent makers, which include among others, Panhard (new town car), Brazier and Cadillac.

This construction is considered by some authorities to be superior in spring action to the half elliptic spring, and in looks it is hardly different from the regular frame yoke or hanger.

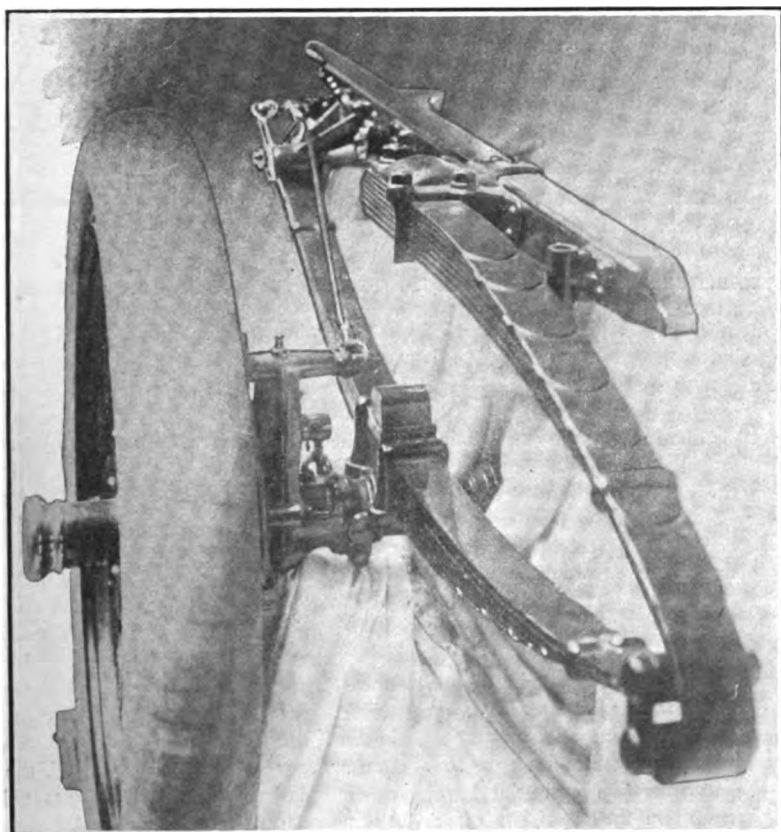
The arrangements of cross springs is usually in the form of a platform spring connecting by double shackles, either with the front or oftener at the rear ends of the rear springs.

A well developed example of this form is shown in the Peerless 1906 model, where the offset rear springs are connected at their rear end with a platform spring, to which center the body is bolted, thereby forming a three-point spring suspension. The leaves of the very long side springs are highly polished to reduce the friction between them, thereby increasing the flexibility of the spring.

An arrangement of a cross spring in front is found on the St. Louis cars, where the front ends of the rear half elliptics are double shackled to a platform spring bolted at its center to a cross frame member.

The platform spring is thereby located under the middle of the body, allowing the standard finish of the rear end of the tonneau, and while offering a long spring action, prevents an excess of swaying of the rear seat.

As an example of a front cross spring, the Moline car may be mentioned. Duryea shows on his runabout his well-known construction of four long double curved quarter elliptics. A very interesting and correct-appearing design of springs was noticed on the Hewitt cars. It consists of a half elliptic spring with the five graded leaves below the main leaf and three above, the leaves not being under any compression when assembled, thus insuring a spring more suitable for different loads than the regular spring construction permits, the upper leaves counteracting the rebound in true spring fashion.



THREE-QUARTER ELLIPTIC REAR SPRING OF CADILLAC SHAFT-DRIVEN CAR.

IMPROVED TRANSMISSIONS AND CLUTCHES.

AN examination of the cars at the New York shows indicates that improvements in transmission systems and clutches have been given serious thought by designers and manufacturers. Very few startling novelties were disclosed, but in many instances refinement of details and re-arrangement of parts, together with improved shop methods, have brought these vital mechanisms of the automobile to a high state of excellence.

One of the most noticeable changes in the disposition of parts in change speed systems is the tendency towards direct drive, or as nearly direct as possible. In the case of final drive by propeller shaft the construction invariably followed is the well-known lay shaft and clutch-jaw or gear-locked drive shaft, which is usually of square section with the train of gears sliding thereon, or, in some cases, mounted slidably as several units, the high speed being obtained by such movement of the gearwheel or clutch-jaws as will effect an engagement with the outside member of the telescoped driving shaft.

In transmissions of this type the drive is direct on high speed; that is, no gears are driving except the pinion and bevel on the rear axle. When low and intermediate speeds are engaged four gears are doing the work; that is, the power is transmitted from the driving shaft to the lay shaft and then back to the outside member of the driving shaft, which member carries the drive to the propeller shaft and rear wheels.

The earlier forms of shaft-driven cars were provided with a simple mechanism in which two gears were employed for each drive, except, of course, that three, as in all clash-gear systems, were necessary for reverse. This same system is still used on a number of foreign cars of the highest grade, but only in the case of final drive by double side chains. Several examples were seen at the shows and the makers claim that the system is economical of energy and that simplicity is a prominent factor in its retention.

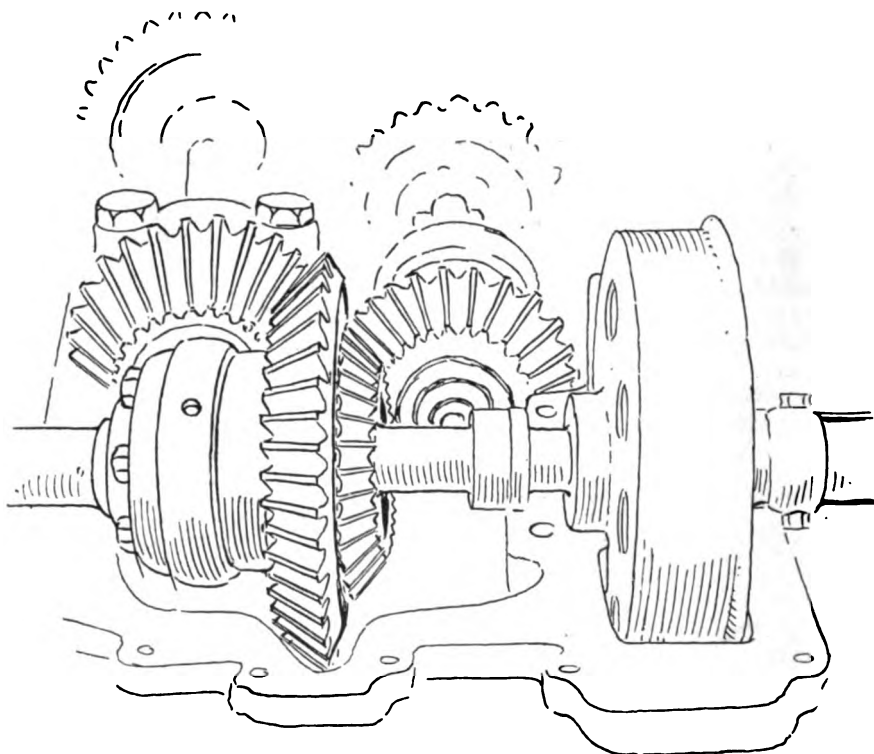
For a double side-chain drive the problem of a direct drive on high speed offers more difficulties and in several instances the object of the designer has been to secure this result and also to accomplish a drive on low and intermediate speeds without the use of more than two spur gears.

The most quoted system in which these results are apparent is found in the transmission of the 1906 Mercedes, seen on the Untertürkheim model and on the American copy at the Armory show. In this change speed system the telescoped driving shaft is used, much in same manner as fitted to propeller-shaft driven cars, but instead of

the low and intermediate drives being returned to the driving shaft an extra bevel gear is provided, which is driven from a bevel pinion on the lay shaft. In the arrangement great care has been exercised to provide a compact grouping of the parts, and the closest examination fails to reveal any waste space in any portion of the case. The bevel gears on the cross shaft are placed back to back and the drive on low speed, second and third is through the one gear on the driving shaft to a gear on the secondary shaft, and thence through the bevel gear from the pinion on the lay shaft,

ential is located midway between the two. However, the result attained is the same and to all intents and purposes the mechanism may be said to provide the same degree of gain in conserving energy. Both the Mercedes and the Züst transmissions owe not a little of their efficiency to the use of ball bearings of the well-known D. W. F. type.

In American motor car practice this result has been reached in the new four-cylinder Knox, recently described at length in *THE AUTOMOBILE*. The Knox transmission is a fine example of American automobile engi-



BEVEL PINIONS ON PRIMARY AND SECONDARY SHAFTS IN BLISS TRANSMISSION.

the outer member of the telescoped part of the driving shaft being free to revolve, necessarily at a slower speed, around the inner member.

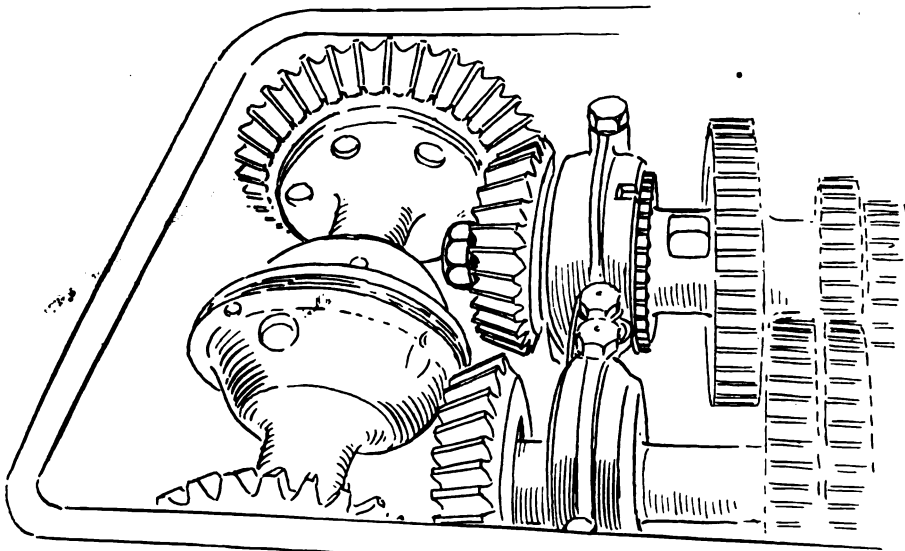
High speed is obtained by the engagement of the third speed gear with an internally cut gear on the beveled pinion at the end of the outer member of the driving shaft, thus locking this shaft so that the drive is direct, no gears driving except the bevel and pinion. The differential is located inside of the change speed case and is in itself a compact mechanism.

This same result has been attained in a slightly different manner in the Züst, an Italian car of considerable reputation abroad but comparatively unknown on this side. In the transmission case the bevel gears are placed upon the cross shaft facing, instead of back to back, and the differ-

neering and the details are carefully carried out and well finished. To reduce friction to the lowest possible point non-adjustable ball bearings are fitted to the shafts.

The direct drive is attained in the same manner as in the Mercedes, the primary shaft members locking by means of an internal gear locking with the third speed gear on the feathered driving shaft. The gear shifts are made by means of a lever working through a gate quadrant and actuating shifter bars.

Another American car built with direct drive on fourth speed and first, second and third speeds through but one pair of gears is the Bliss; but instead of the selective system a progressive gear set is used, the various speeds being secured by the travel of a sliding set on the primary shaft. The drive to the secondary shaft is through any two



JUST TRANSMISSION FOR SIDE CHAIN DRIVE, SHOWING BEVEL GEARS ON PRIMARY AND SECONDARY SHAFTS AND ON COUNTERSHAFT.

predetermined gears and a beveled pinion on the secondary shaft to a bevel gear on the cross shaft. In the disposition of gears in this transmission the bevel gears on the cross shaft are back to back, as in the Mercedes and Knox.

Variations of the conventional arrangement of disposition of the transmission and cross shaft in cars with double side-chain drive are met with in several machines, notably in the English Daimler, where the driving or primary shaft is located at the bottom of the case with the secondary shaft above and the beveled pinion on the front. The transmission is provided with non-adjustable ball bearings on both shafts, and exhibits careful workmanship. Changes are made by means of a selective lever in a gate quadrant with a separate lever for the reverse.

The usual longitudinal arrangement of primary and secondary gear shafts has an

exception in the Pope-Toledo, in which car the shafts are set transversely across the frame, the drive being taken from a bevel pinion at the end of a short propeller shaft. Variations of the typical transmission arrangement are found in such cars as the Stevens-Duryea, Northern, Buick, Maxwell-Briscoe and others where the crankcase of the engine and the transmission case is either an integral part or the two are rigidly connected to form a unit.

A well-planned transmission set is to be found in the Peugeot, where the change speed is self-contained and drives to the cross shaft through a short propeller shaft and a universal joint, the beveled gear and pinion with the differential being housed in a separate casing a considerable distance to the rear of the change speed.

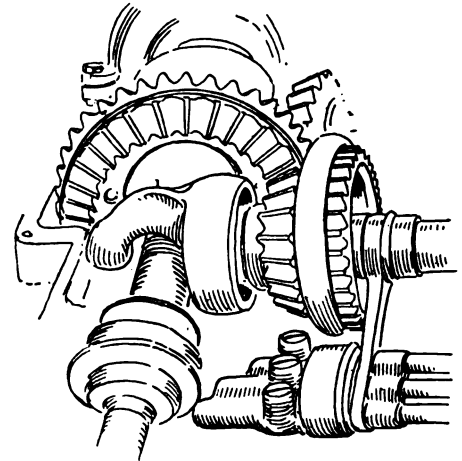
A transmission brake, of generous dimensions, is also contained within the rearmost

case, the other service brake being located on a drum on the short propeller shaft, just at the rear of the change speed. This disposition of the transmission admits of the use of very short chains on a chassis of extra length and minimizes troubles from distortion of the frame under adverse road conditions and high speed.

A somewhat similar arrangement is found in the 60-horsepower Clement-Bayard where the bevel gears are housed in a separate case, which, however, does not contain a brake, this mechanism being enclosed in a separate compartment.

There seems to be a growing tendency on the part of builders of cars of high power to include a service brake as a contained member of the transmission, the purpose being to afford perfect protection to the braking surfaces and lubrication of the parts.

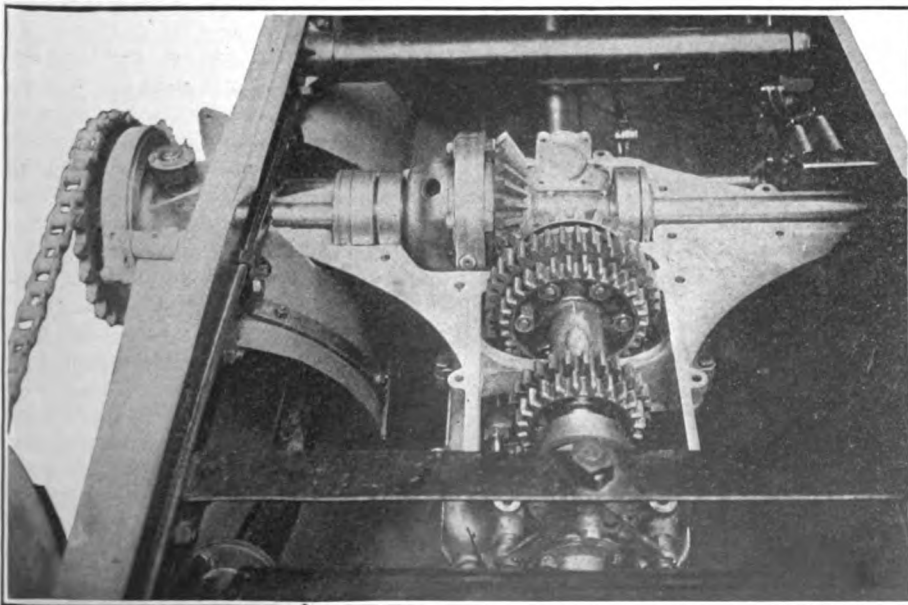
The growing popularity of the selective system of gear engagement has resulted in the use of shorter transmission assembly, and in a number of instances advantage of



KNOX TRANSMISSION SHOWING ENGAGEMENT OF THIRD SPEED GEAR IN INTERNAL GEAR CUT IN BACK OF BEVEL PINION.

this fact has been taken to provide a universal joint between the clutch and the change speed. Even in the type of change speed in which the sliding gears are a unit, care has been taken to keep the dimensions within certain limits, and transmissions are far less cumbersome and seem more fitted to the improved chassis of this year.

In a number of instances the maker has deemed it wise to provide for the engagement of the reverse by means of a special lever. This is seen on the Packard, Napier, English Daimler, Austin and other cars. The method of control is to place the gears in neutral position by means of the forward speed-change lever and then bring the reverse into engagement by a movement of the second lever. In a number of transmissions this is effected by means of a wide pinion which may be dropped or raised to engage with the first speed gears on both the primary and secondary shafts. In the case of the Frayer-Miller car the swinging pinion is actuated by a movement of the same lever that actuates the other changes of speed.

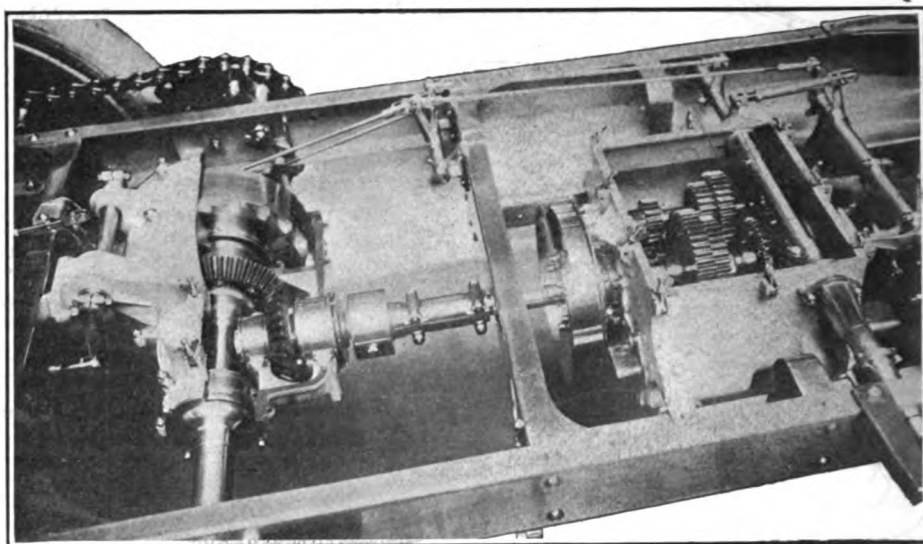


PLAN VIEW SHOWING DISPOSITION OF SHAFTS AND GEARS IN ENGLISH DAIMLER TRANSMISSION.

The disposition of the transmission system in nearly all cars in which clash gears are used is between the motor and the rear axle, usually well forward, but exceptions, such as the Packard and the new four-cylinder Northern, may be noted. In both the three-speed and reverse transmission is contained within the combined bevel gear and differential case at the center of the rear axle, the Northern rear axle only being illustrated, as the Packard is a familiar assembly.

That the planetary change speed is a reliable mechanism is evidenced by a number of examples to be found on cars of high power and considerable cost, the Ford new six-cylinder and the two high-power, four-cylinder Cadillacs being prominent examples. In cars of moderate cost the planetary system is holding its own and a number of refinements and greater care in processes of manufacture give promise of a continuation of this excellent mechanism. In the Cadillac the use of three speeds instead of the usual two and reverse is worthy of note. In all planetary transmissions examined the high speed is obtained by locking the system so that direct drive is secured without any gears driving.

A system of merit, but not found in many machines, is the individual clutch with constant gear engagement. This is exemplified in the familiar Winton transmission, in which drive is secured by means of metal-to-metal clutches actuated by suitable side levers with such disposition of the gears that two speeds and reverse are obtained with a direct drive on second speed. In the Welch car a somewhat similar type of



PLAN VIEW OF PEUGEOT CHASSIS SHOWING SHAFTS AND GEARS OF TRANSMISSION SYSTEM.

transmission is found, but drive is effected by means of multiple disk clutches, the same number of speeds being obtained as in the Winton, and also direct drive on second speed. The disks are of steel and bronze, six and five, contained in an oil-tight case which is provided with hollow ears to carry the bronze disks, the alternate steel disks being carried by the hexagonal shaft which has a bearing inside the primary shaft.

An ingenious oiling device is provided, too, for the lubrication of this bearing. A thin steel disk is attached to the outer member of the telescoped shaft and to the face of this plate is brazed a small spirally bent copper tube with the inner end in communication with the bearing. As the shaft revolves in the transmission case oil is picked

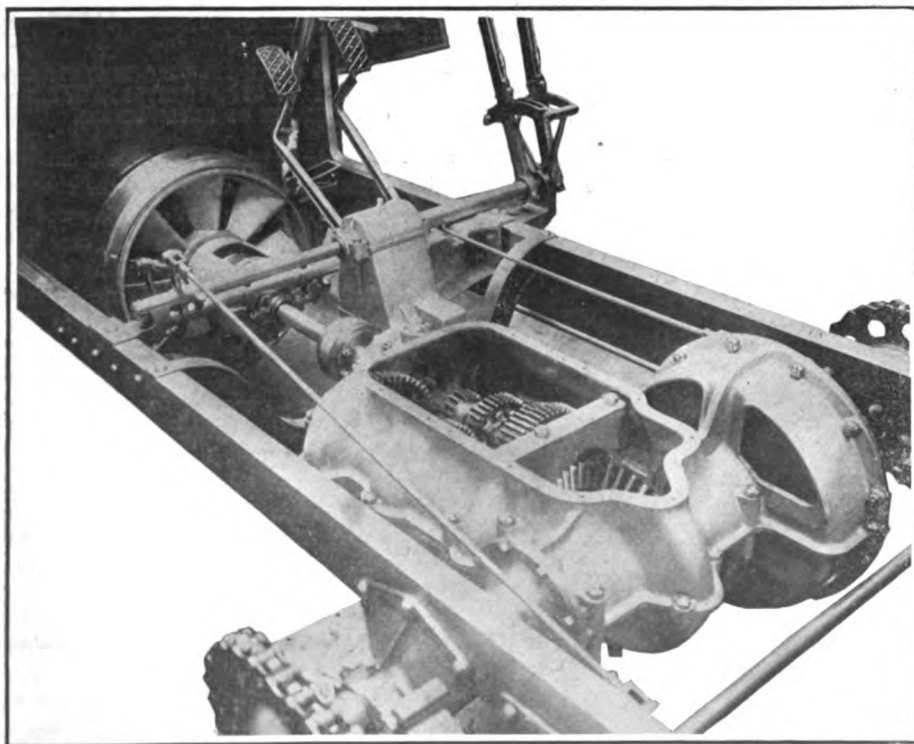
up at each revolution and carried direct to the bearings surfaces.

A new idea in transmissions to be exhibited at the shows is the Belden which possesses several features of the clash gear, but the shape of the gear wheels meshing for reverse and first and second speeds is along new lines. The system, which may be used for either double chain or propeller shaft drive, is dependent for its action on a gear driven disk which is slidably mounted to be thrown into and out of engagement with a specially shaped gear mounted on the splined rear axle or differential cross shaft in such a manner that the limit of its travel in one direction causes it to interlock, by means of jaw clutches, with the bevel gear secured to the shaft. The face of the disk is provided with two sets of conical studs concentrically placed which engage with the traveling gear wheel on the cross shaft, the studded wheel driving through teeth on its periphery which engage with a spur pinion on the propeller shaft, forward of the usual bevel pinion.

To engage first speed the disk is moved away from the cross shaft, this movement disengaging, by means of linkage, both the studs and the spur gear drive when suitable transverse movement carries the sliding gear into position for engagement with the inner set of studs, further movement of the change speed lever setting the disk into engagement with the spur pinion and carrying the disk toward the cross shaft and into engagement with the sliding gear. Second speed is obtained by further travel of the slide gear, and reverse by the travel of the slide gear past the center.

The consideration of transmission devices would be incomplete without reference to the friction drive system which is seen on a number of cars and as a special demonstration on several chassis.

One of the best known devices of this kind is found on the Lambert car which is made in several models with motors of different horsepower. The final drive is by means of double side chains, from sprockets



PART VIEW OF CHASSIS OF C. G. V. CAR SHOWING CONE CLUTCH WITH FAN BLADES IN FLYWHEEL AND CASING INCLOSING CHANGE SPEED GEARS AND DIFFERENTIAL. CIRCULAR CASING ON RIGHT REAR OF GEAR BOX INCLOSES SERVICE BRAKE.

carried at the ends of the splined cross shaft which is held at a constant distance from the rear axle by means of adjustable distance rods. This cross shaft is provided with a differential and a brake drum. The engine shaft is extended rearwardly and at the end a large disk, faced with an aluminum alloy, performs the double function of fly wheel and driving member of the system. On the splined cross shaft is mounted a light wheel with compressed paper rim. This wheel is brought into engagement with the driving disk by suitable linkage, actuated by a foot lever, the position, and consequently the speed of the vehicle, being regulated by means of a side lever moving over a notched quadrant. For all practical purposes the five speeds notches provided are sufficient, though any graduation between zero and maximum is possible. The reverse is obtained by a movement of the sliding member past the center.

The "Windsor" transmission is called by the makers a double rolling traction. Two large disks are carried as flywheels from the engine, and between these disks are located two driven wheels which operate two countershafts, carrying at their ends sprockets for the side chain drive. A suitable lever brings the driven wheels in contact at points diagonally opposite, the forward engine-driven disks driving one transmitting disk and the rear engine disk driving the other. In effecting this contact the driven disks are each independently driving the rear wheels, sufficient differences of peripheral speed and slight slippage are claimed by the makers to obviate the necessity of a differential gear. Various speeds are obtained by sliding the driven wheels in and out from the driving shaft, a suitable hand wheel above the steering wheel being provided for the purpose. The contact of the disks is controlled by a side lever working over a ratchet sector. To bring the reverse into action the contact of the driven disks is reversed, the front and rear engine disks driving from the diagonally opposite points engaged for drive ahead.

Another transmission acting through the medium of friction disks and eliminating gears is the "Gearless," which is so arranged that when high speed is engaged the disk drive is idle. This result is attained by driving through three disks for low, intermediate speeds and the reverse, the driving disk being slidably mounted on a shaft in line with the engine shaft and the limit of the forward motion engaging a suitable clutch with the flywheel hub so that the turning movement of the

motor is carried to the driving wheels without effort on the part of the friction disks.

In the arrangement of the various parts the drive is first from the flywheel rim to the periphery of two smooth-faced disks which are mounted at right angles to the engine shaft with provision for movement to and from the shaft. On a splined shaft is carried a third disk, this shaft being free to turn in either direction with reference to the engine shaft but in line with it. When it is desired to engage a speed the side disks are drawn away from contact with the driven wheel by means of a foot lever acting through suitable linkage and cams, and the driven disk is carried to the position desired on the splined shaft, when the side disks are brought into contact by means of the foot lever, two cams acting in unison so that the pressure is applied evenly from both members. Engagement of high speed causes the side disks to remain out of contact with the driven disk.

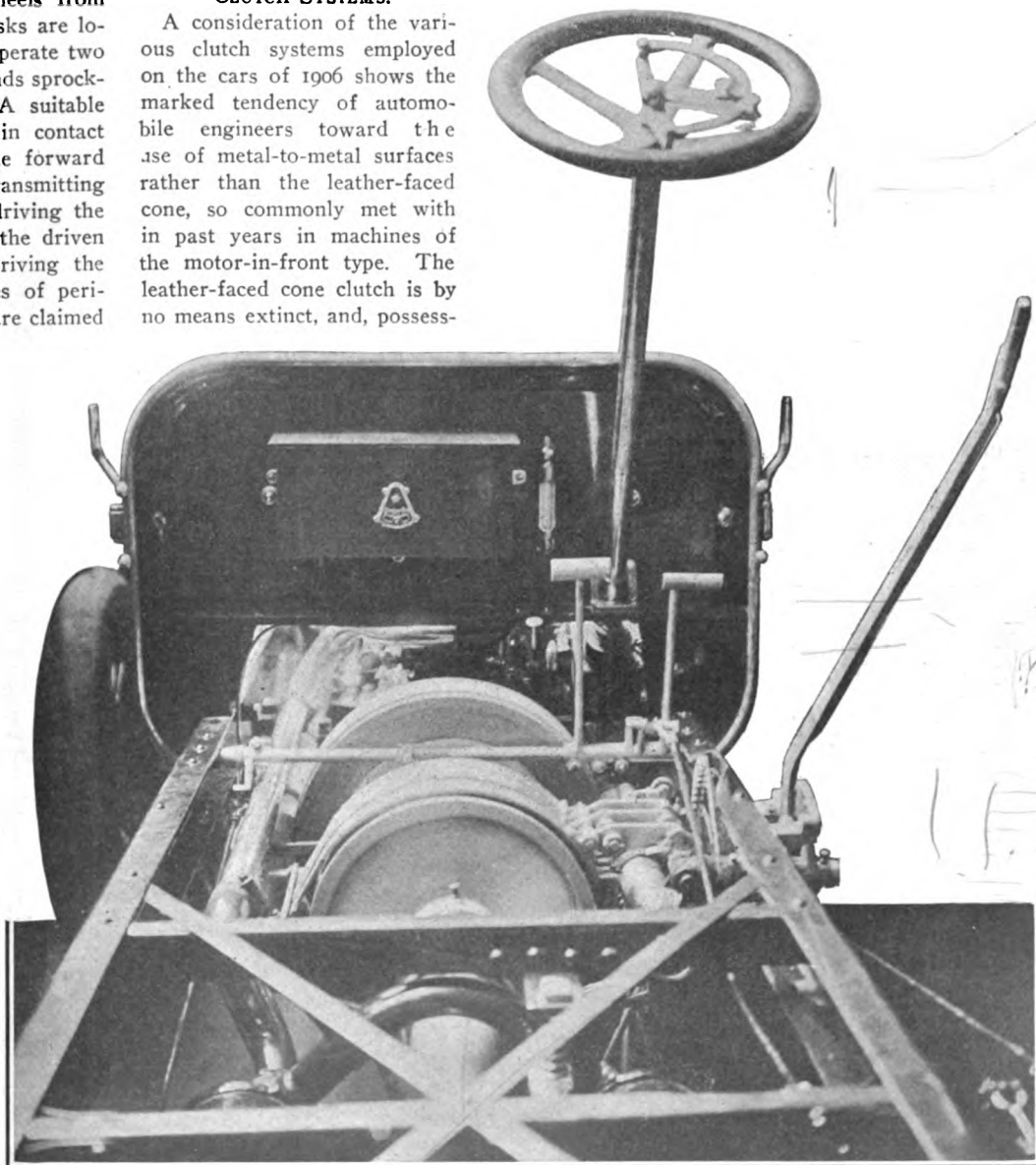
CLUTCH SYSTEMS.

A consideration of the various clutch systems employed on the cars of 1906 shows the marked tendency of automobile engineers toward the use of metal-to-metal surfaces rather than the leather-faced cone, so commonly met with in past years in machines of the motor-in-front type. The leather-faced cone clutch is by no means extinct, and, possess-

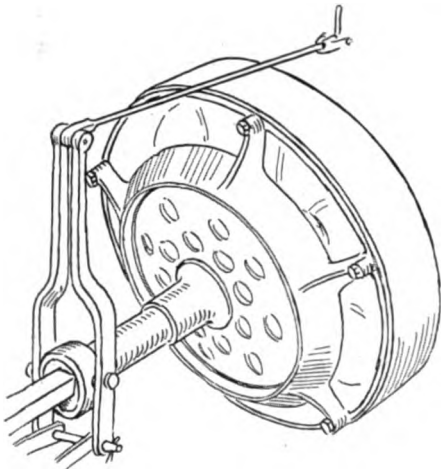
ing many advantages, has its adherents, a number of the best made foreign cars of this year being so fitted, to say nothing of a considerable number of distinctive American machines of high merit.

In a number of American cars effort has been made to provide for the more gradual engagement of the leather-faced clutch, springs, and in several cases spring actuated studs being interposed between the leather and the male member in such a manner that upon engagement a gradual seating is obtained. This is particularly noticeable in the Corbin car, in which a number of bronze studs are so disposed that a direct pressure is exerted against the female cone when the clutch is let into engagement. A device of the same nature is used on the Columbia and is said to contribute to the "sweetness" of clutch engagement in a marked manner.

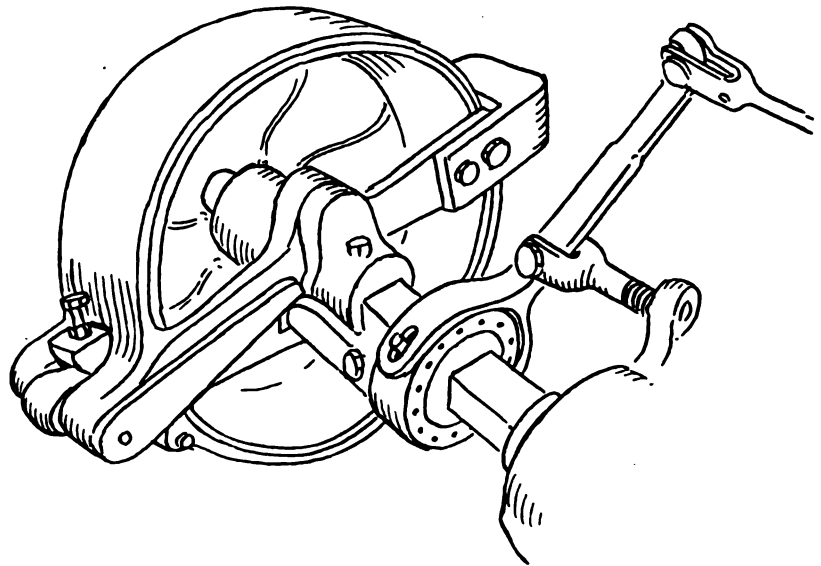
The impossibility of building a fan in the flywheel has been urged as an objection to the conical leather-faced clutch, but in a



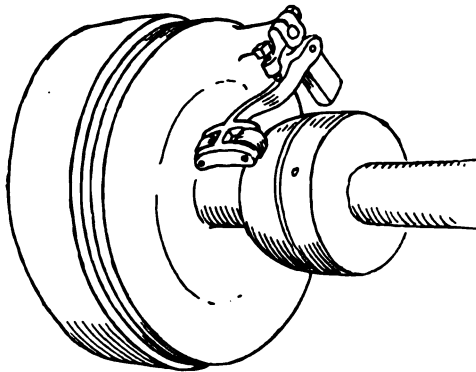
CHASSIS OF CADILLAC 4-CYLINDER TOURING CAR SHOWING PLANETARY 3-SPEED TRANSMISSION ACTUATED BY SIDE LEVER.



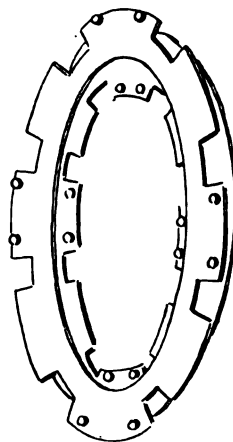
**PRAYER-MILLER REVERSED CONE CLUTCH
WITH PERFORATED REAR PLATE TO
FACILITATE AIR COOLING.**



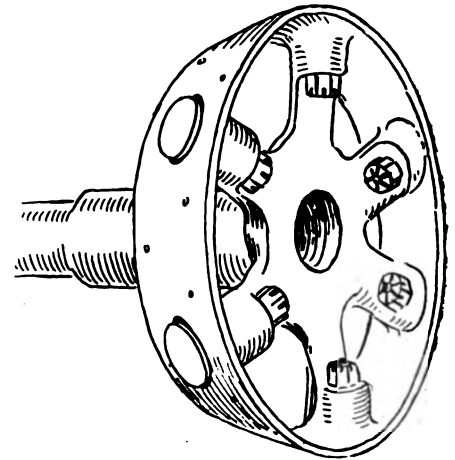
APPERSON EXTERNAL CONTRACTING BAND CLUTCH AND OPERATING MECHANISM



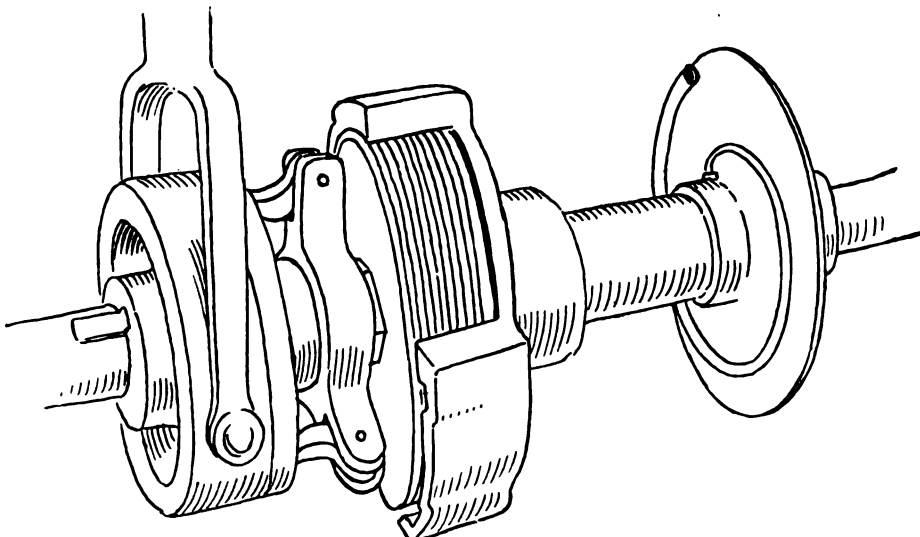
**ELMORE SLIDING CONE AND ARM ACTUATING
INTERNAL EXPANDING RING CLUTCH.**



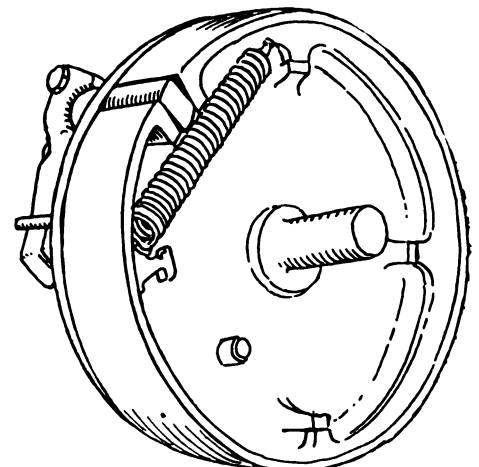
**TWO ADJACENT PLATES OF ZÜST MUL-
TIPLE DISK CLUTCH SYSTEM.**



**MALE MEMBER OF CORBIN CLUTCH WITH
SPRING ACTUATED STUDS IN FACE TO
PROVIDE PROGRESSIVE EN-
GAGEMENT.**



**INDIVIDUAL MULTIPLE DISK CLUTCH OF WELCH TRANSMISSION. SPIRAL TUBE ON PLATE
AT RIGHT IS USED FOR CONDUCTING OIL TO TELESCOPED SHAFT.**



**FRONT VIEW OF INTERNAL MEMBERS OF
ELMORE EXPANDING RING CLUTCH. NOTE
LUGS ON PLATE AND RING TO KEEP
RING CONCENTRIC.**

notable instance this issue has been met with success. The C. G. V. is provided with a fan of generous dimensions not only in the flywheel but in the male member of the clutch as well. The vanes extend well outward and well into the hub, so that high cooling efficiency is obtained without abandonment of the cone type.

A supplementary flywheel fan is employed in the Frayer-Miller car, the reversed female cone being carried from the rim of the flywheel by means of a spider with suitable perforations in the male member of the clutch to permit the free passage of air thrown from the vanes on the flywheel.

A popular type of clutch at this time is the multiple disk, which is well known by reason of its use on a number of American

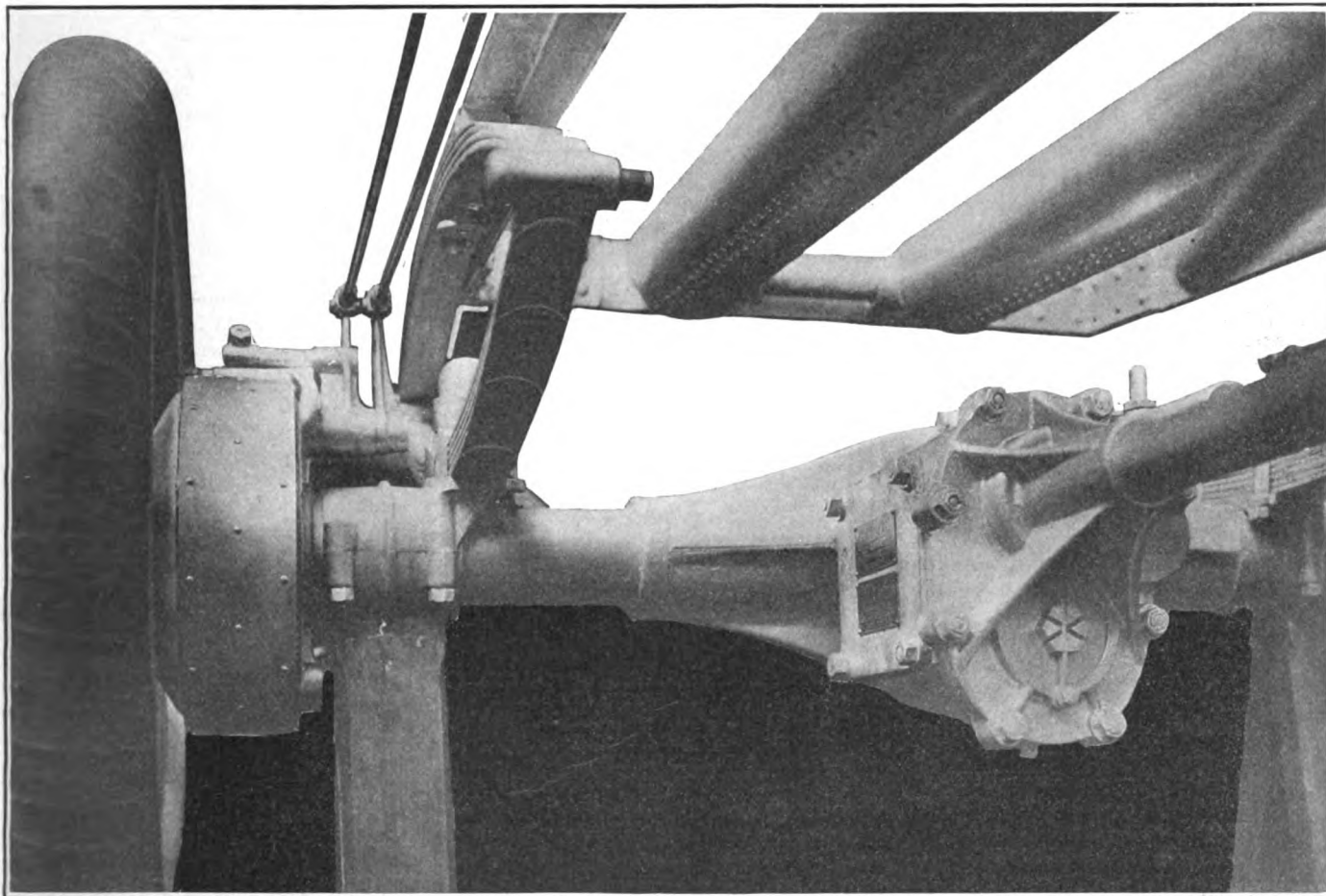
being brought into engagement by suitable spring pressure, with the result that contact of the surfaces takes the drive from the engine to the transmission system. In the choice of metals the matter is entirely a subject of experimentation or preference on the part of the manufacturer, one using polished steel against hardened steel which has been slightly warped in the tempering process, another bronze against steel, and another leather-faced plates bearing against hardened and highly polished steel.

In a number of multiple disk clutches the several members are made of very thin sheet steel with suitable projections formed on the outer and inner edges to prevent the alternate plates from turning when out of engagement.

The principle involved is a constricting helical spring around a suitable drum, the pressure necessary for complete engagement being applied progressively, so that gradual starting of the car on various speeds is insured.

Generally speaking, the manufacturers of cars provided with transmission devices of the planetary type have not seen fit to equip their machines with separate clutches, depending on the constricting band on the planetary drum for engine disengagement, but several exceptions were revealed, notably in the Elmore and in the four-cylinder Cadillacs.

The former is provided with an internal expanding clutch designed much on the lines of the usual rear wheel brake. The ex-



VIEW OF THE NORTHERN REAR AXLE FROM UNDERNEATH THE CAR FRAME. NOTE GEARBOX ON BACK AXLE CONTAINING CHANGE SPEED AND BEVEL GEARS, AND DIFFERENTIAL. ALSO NOTE WIDTH OF BRAKE FACE AND DOUBLE BARREL MUFFLER.

cars well established in favor. One of the prime advantages of this clutch is the ease with which it may be inclosed within an oil-tight and dustproof case, a condition contributing not a little to the facility of car cleaning and general up-keep of the power plant.

The Maxwell-Briscoe and Stevens-Duryea are two cars which have used this type with entire success, the mechanism of both cars being favorable to the application of the multiple disk clutch.

In the multiple disk clutch a number of plates of metal are alternately attached to the engine shaft and the transmission shaft,

In the arrangement of the engine crankcase and transmission case as one unit, as in the Stevens-Duryea, the Maxwell-Briscoe and the four-cylinder Buick, the multiple disk is almost the only type possible without unduly increasing the dimensions of the compartment enclosing the mechanism.

The helical clutch as used on the Mercedes is found in several instances, and when carefully made is a satisfactory means of engine engagement. Its small size and the ease with which it may be enclosed in an oiltight and dustproof case contribute to the advantages which it possesses as a ready means of engagement of the drive.

panding shoe is actuated by means of a sliding cone which is mounted on ball bearings on the transmission shaft, a forward motion of this cone engaging the clutch through suitable mechanism. The expanding member has a bearing against a drum mounted on the engine shaft by means of a universal joint. The expanding shoe is prevented from contact with the engine shaft drum when the clutch is out of engagement by means of small lugs which rest against corresponding lugs on the driven member.

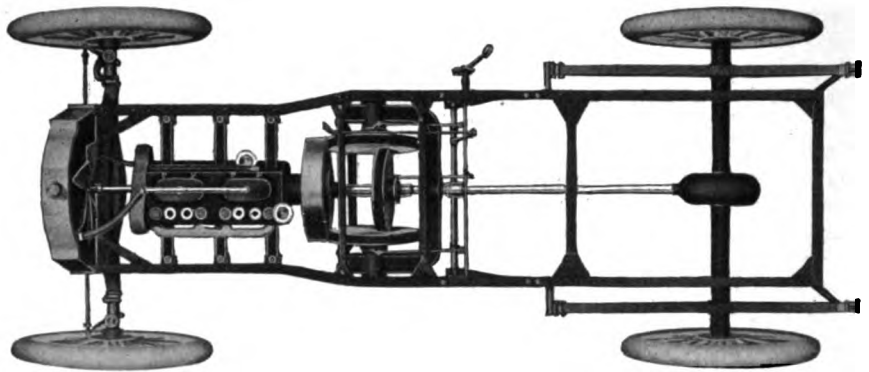
In the Cadillac a plate clutch is interposed between the engine and the transmission, the drive being by means of the

contact—through the medium of eight small helical springs—of large diameter plates located in the flywheel. The actuation is by two cams on the transmission shaft, brought into action by a rocking lever which revolves the cams in opposite directions around the shaft.

An external contracting clutch is found on the Apperson and Haynes cars. It is of simple construction and light in weight, so that there is no great momentum imparted to the primary shaft of the transmission when the engine is disengaged. The movement of the cam-shaped sliding finger on the hub effects a constricting effort of the band by means of the lever which is carried inwardly from the two ends of the band which are connected, one to the supporting arm radiating from the hub of the free member and the other to a short crank at the end of the lever. The action of the clutch is progressive and the drive is taken up smoothly with positive hold when the band is fully engaged.

The metal-to-metal cone clutch is found on a number of cars, among which may be mentioned the new four-cylinder Knox and the Napier six-cylinder. In the former the clutch is of large diameter and enclosed within an oiltight case provided by the application of a plate to the rear face of the flywheel. As the clutch is of large diameter, and consequently possessing considerable momentum, a means has been provided to slow up the speed when the driven member is disengaged for changing speeds. A plate is fitted to the transmission shaft a short distance back of the flywheel and a sliding plate of like diameter mounted on two rods rigidly attached to the frame with springs for keeping the slidable plate out of engagement, except when under compression from the linkage interconnected with the declutching pedal. The contact of the revolving plate with the stationary one exerts sufficient braking effort to slow the clutch and the primary gear shaft, contributing to the ease and safety of gear engagement.

The internal expanding segmental clutch, patterned after the familiar internal expanding rear wheel brake, has been adopted by a number of representative concerns, and when encased in an oiltight compartment, with ample lubrication, the engagement is

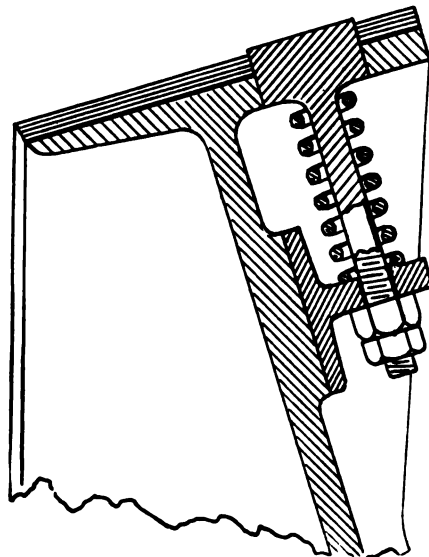


PLAN VIEW OF THE "GEARLESS" FRICTION TRANSMISSION WITH ARRANGEMENT FOR DIRECT DRIVE ON HIGH SPEED.

progressive and the drive positive. Declutching effects an instantaneous release, and by reason of the small size of this type the inertia is less than with the cone clutch and changes in speed may be made with comparative immunity to the gears. The Berliet

circulation without the use of a fan between the radiator and the motor.

The use of a small number of disks, three in the case of the Thomas, is a modification of the multiple disk type, and as used on this car has proved entirely satisfactory. The floating plate between the engine driven disk and the plate attached to the primary transmission shaft is perforated for the reception of small cylindrical sections of cork, which provide gradual contact by inducing a small amount of slippage before the drive becomes positive. A helical spring under control of a declutching fork provides the necessary pressure to bring the plates into contact for engagement of the drive, the separation of the plates being assisted by means of four pins connected with long levers extending inwardly to the hub of the sliding transmission member.



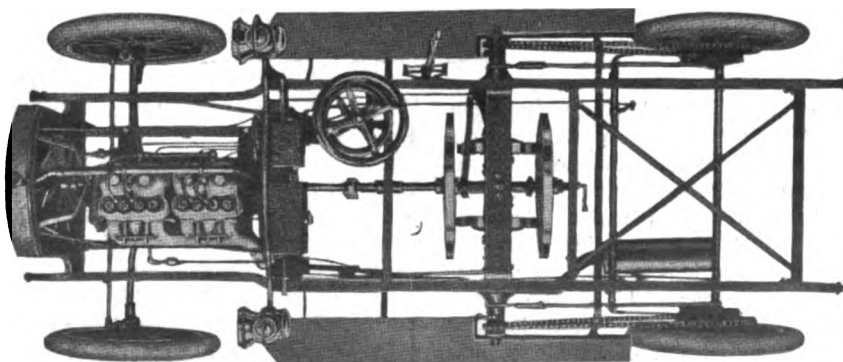
SECTION OF MALE MEMBER OF COLUMBIA CONE CLUTCH SHOWING ONE OF THE SPRING ACTUATED PLUNGERS FOR PROGRESSIVE CLUTCH ENGAGEMENT.

clutch is of this type, with two expanding segments, the entire mechanism being enclosed in the hub of the flywheel and of such small diameter that the vanes in the flywheel are of sufficient size to provide air

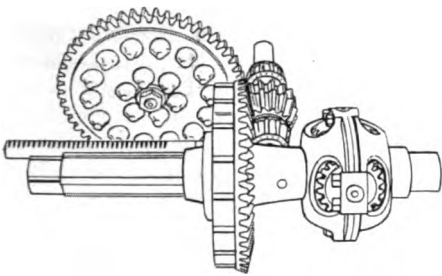
In the Autocar clutch, which has remained practically unchanged for a number of years, a floating bronze ring is used to take up the drive and the necessary pressure is provided by three toggles which are adjustable and so designed that the drive is positive after the pressure applied by means of a strong helical spring carries the toggles past center. The bronze ring is loosely attached to the flywheel at four points on its circumference and is provided with a number of cork sections extending through its face to contribute to progressive engagement. In the run-about made by the Autocar company the clutch engagement has been changed from hand to foot control, the conventional arrangement of this important function.

A discussion of all the clutches shown on the cars of 1906 would call for detailed descriptions in nearly every case, as manufacturers are working independently, although along similar lines, for the improvement of this mechanism of the automobile. In the way of decided novelties, but one type was shown which departed from previous practice in the principle involved. This was found in the new four-cylinder Northern, a car fairly bristling with features, the pneumatic clutch providing a type which has hitherto been absent from automobile exhibitions.

The clutch is contained within the flywheel, which has a series of fan vanes cast around the clutch-enclosing hub, which is



PLAN OF CHASSIS EQUIPPED WITH WINDSOR "ROLLING TRACTION" FOUR-PLATE TRANSMISSION.



PERSPECTIVE VIEW OF BELDEN TRANSMISSION.

so built up that an airtight compartment is formed for the action of a heavy leather flexible diaphragm. This diaphragm is clamped around its periphery in such a manner that it has a slight movement fore-and-aft within the circumferential points of attachment. Back of the diaphragm is a smooth steel disk which is affixed to the transmission by means of a universal joint contained in the bronze hub of the disk, the drive going to the rear wheels by means of a propeller shaft and a sliding gear transmission located on the rear axle. The smooth disk has a backing of leather and fiber which is circumferentially attached to the flywheel and supported throughout a sufficient part of its superficial area to provide an unyielding seating when the clutch disk is forced into engagement.

The requisite air pressure to effect an engagement of the clutch is provided by an air pump driven off the camshaft of the motor, with suitable piping to carry the compressed air to the forward end of the crankshaft through which a 3-8-inch passage is formed to admit the air to the forward side of the flexible leather disk. The operation of admitting air and of effecting a release of the clutch is performed through the medium of a small finger lever set above the steering wheel and connected to a two-way valve.

It is obvious that if sufficient air pressure

is admitted to the restricted compartment between the flexible disk and the inner face of the forward member of the flywheel that the frictional contact of the leather disk and the leather-faced backing will grip the transmission shaft plate and transmit the turning effort of the motor to the propeller shaft and rear wheels. In practice the device is said to work with the utmost smoothness and highest efficiency, clutch engagement

being progressive by reason of the gradual application of the actuating medium and of slight slippage of the driven disk, which, however, is entirely absent after complete engagement.

The air pump is located at the rear of the engine in an accessible position and is fitted with a safety valve which is set to relieve the pressure when fifty pounds per square inch has been pumped up.

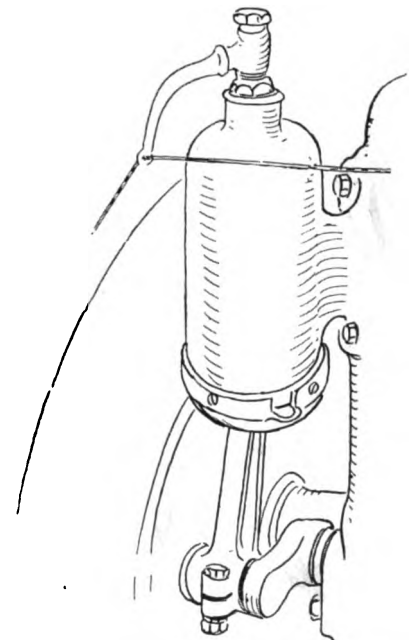
Methods in Brakes Seen at the Shows.

OF the brakes in common use on automobiles, as displayed at the New York shows, the external type consists of either a flexible band attached to some portion of the stationary part of the chassis at a point in the middle of the length of the strap and drawn together at the ends for gripping the brake drum by aid of end attachments in one of which a bell crank is hinged, and the other having an adjustable link connecting it to the bell crank by pin connection; or of two rigid parts each extending nearly half way around the drum, and hinged so as to open and close in the manner of the shell of the clam. The support to the stationary part of the machinery is usually at the hinge. The two free ends are then drawn together in a manner similar to the band type for gripping the drum, arrangements being made for adjustment to take up wear.

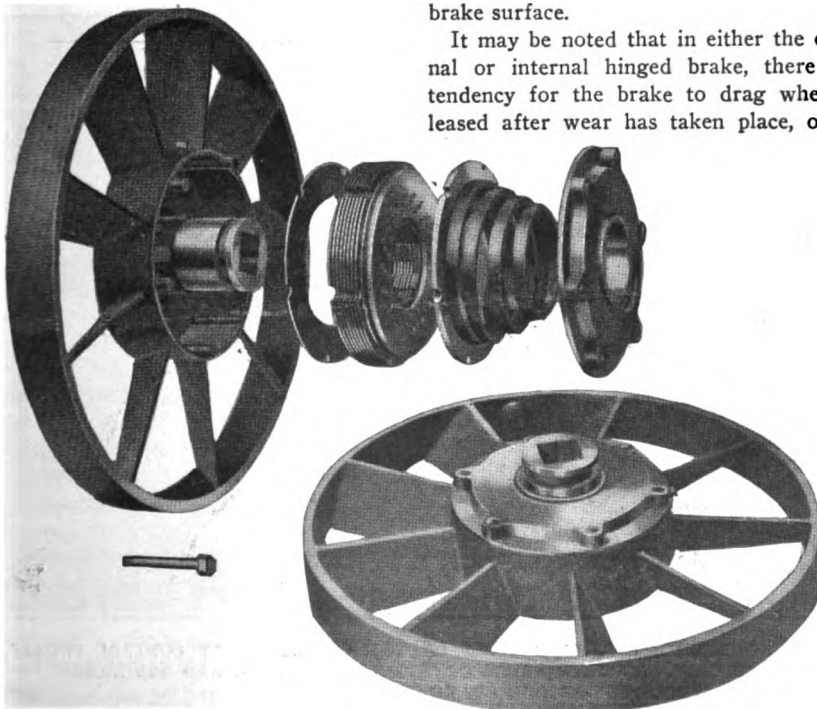
The internal type is the reverse of the external in its action, but is otherwise very similar, one operating by the expansion of a flexible ring fastened to the frame of the machine at about the middle of its length, and the other consisting of two similar rigid parts hinged together and opened by a bell crank or cam between their ends to set them out against the internal cylindrical brake surface.

It may be noted that in either the external or internal hinged brake, there is a tendency for the brake to drag when released after wear has taken place, on ac-

count of the much greater motion and the consequent wear at the freely moving ends operated by the bell crank or cam. The band or ring also has this objectionable feature to some extent. The remedy for dragging in the clam-shell brake shoes is to cut away a considerable portion of the rubbing surface of the brake shoe near the



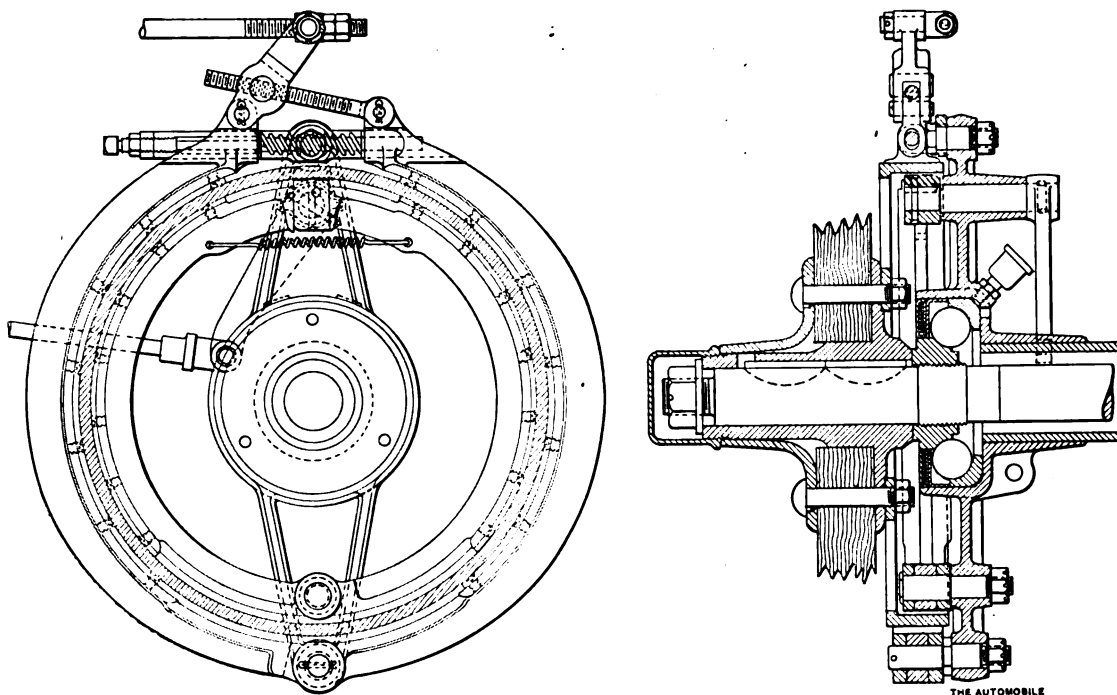
AIRPUMP ATTACHED TO VERTICAL MOTOR.



VIEWS OF FRANKLIN MULTIPLE DISK CLUTCH ASSEMBLED AND APART.

pinned joint in that type. By suspending the band or jaws from the top by a somewhat loose connection, the dragging is somewhat lessened.

A type of expanding ring that has been adopted to some extent for friction clutches might also be applied to advantage in the expansion brake. It consists of a flexible ring supported in position by four short lugs extending from its inner surface in toward the center a short distance, and resting loosely on corresponding lugs of the rigid part of the frame. On account of being so supported, the band is entirely self-centering when applied by the motion of a cam which separates the ends in order to set it against the moving surface. In addition to entirely freeing itself, so as to have no drag when released, it also has the advantage of great simplicity, lightness and ease of replacement when worn out. The only adjustment for wear necessary is that



DOUBLE BRAKES ON REAR WHEELS OF PIERCE GREAT ARROW CAR. A TYPICAL EXAMPLE OF INTERNAL AND EXTERNAL EMERGENCY AND SERVICE HUB BRAKES.

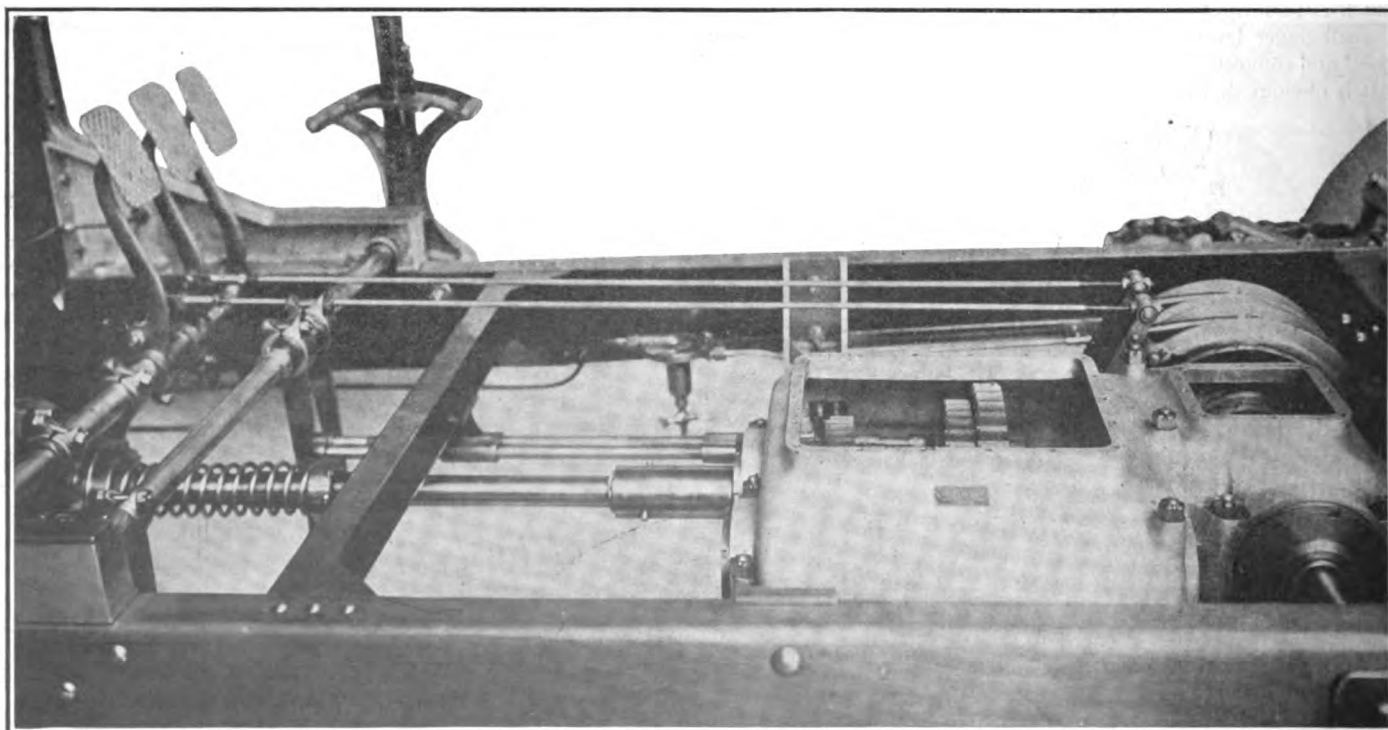
of setting the lever rods so as to rotate the cam or pin connected bell crank a little farther to open the ring out wider as wear occurs.

Except in rare cases the emergency brakes are placed on the rear wheel hubs, and are operated by hand. In one design, however, the emergency brakes are foot operated, and in another they are on the countershaft. Except in one or two isolated cases, setting the emergency releases

the clutch, the release taking place just before the brake begins to grip.

The importance of setting both emergency brakes with equal pressure has been quite generally recognized, and provided for by some sort of device for equalizing the force acting on them. In many cases an equalizing bar connected to the brakes has the pull from the lever applied at its center and distributed to the brakes from the ends. This equalizing bar in some cases

extends across the entire width of the chassis and either rods or cables connect from each end to the corresponding brake. In other cases two bell cranks are used on the same rod extending across the frame, each with a crank arm from which a tension member extends back to the corresponding brake, and the inner ends which are brought near together are each provided with a crank. A short equalizing lever is placed between these two inner crank arms from



CHASSIS OF ROCHET-SCHNEIDER AT THE GARDEN SHOWING DOUBLE SERVICE BRAKES ON THE COUNTERSHAFT CONTROL PEDALS, AND CONNECTIONS. ONE PEDAL CONTROLS THE CLUTCH ONLY. ANOTHER PEDAL CONTROLS THE CLUTCH AND ONE BRAKE. THE THIRD PEDAL CONTROLS THE SECOND BRAKE ONLY.

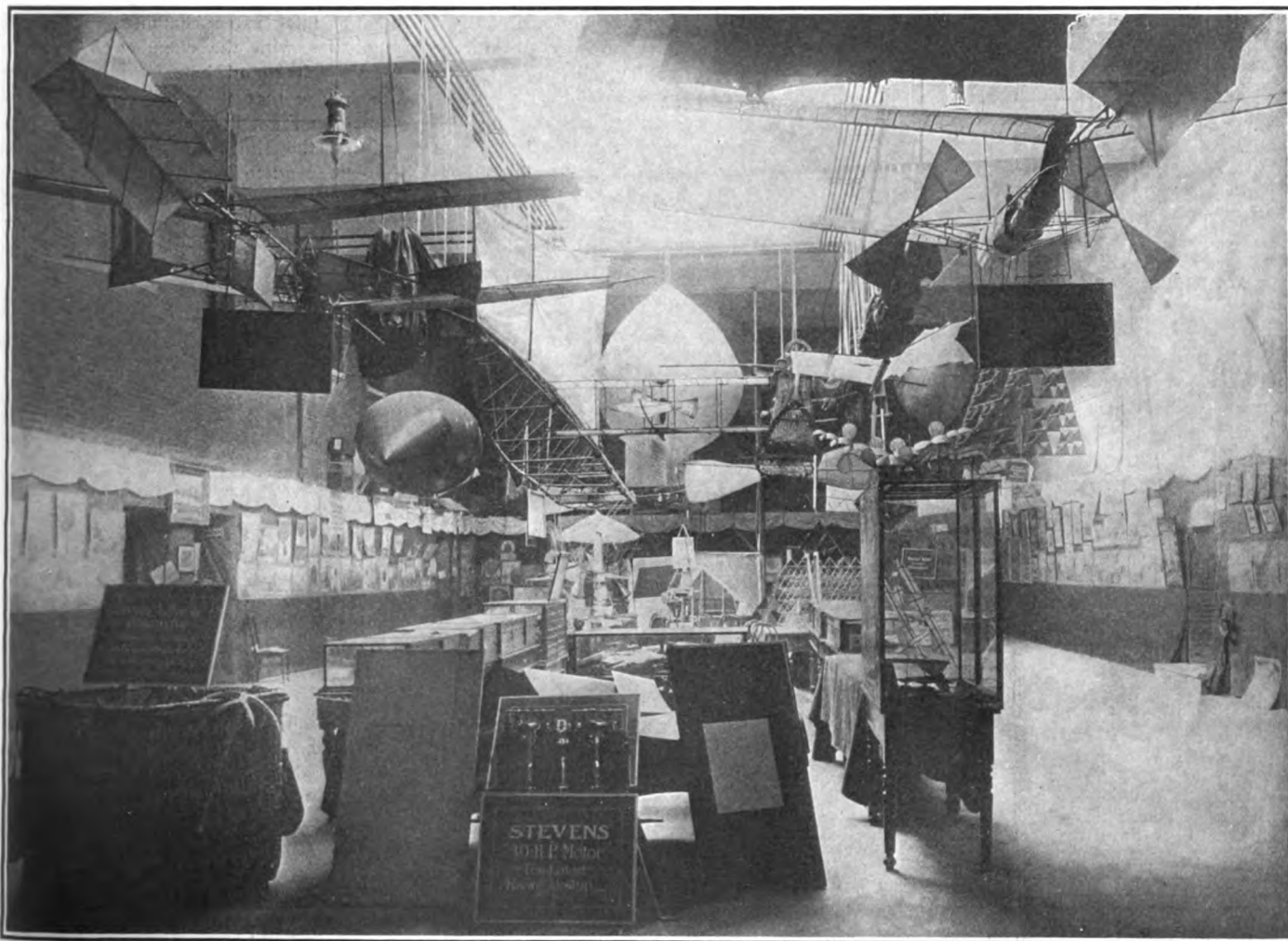
which the tension rod for setting both brakes connects to a crank on the hand operated shaft for applying the power.

Instead of this short equalizing bar, one chassis shows a modification in that particular part of the system by the introduction of the wire cable having the ends fastened to the two levers, and extending over a small pulley in a third lever or crank on the cross shaft which is operated by hand. This provision for the free motion of the cable over the pulley allows perfect equalization of pressure on the brakes.

is rather surprising to note that this method with short bends has been retained on some of the highest priced cars despite the objection just cited, and with the disadvantage of a far less neat appearance than rods and equalizing bars. The fastenings of the cables are not neat and sharp ends are left projecting.

Those operating the emergency brake by a pedal claim that their object is to provide a method by which the clutch can be released and brakes applied with the greatest quickness, and that it can be done by the

ble attention. A small tank varying in size from one to three gallon capacity is attached to the car, sometimes high enough to allow water to flow by gravity upon the rotating part of the brake, but often placed low and compression used for driving the water out. This compression method is generally used in connection with the compression system of supplying gasoline from a tank below the frame of the machine in the rear. Either compression from the exhaust or by pump is used. Since but a slight amount of water is required for cooling the brakes,



VIEW OF EXHIBIT OF FULL-SIZED APPARATUS, WORKING MODELS, DRAWINGS, AND PHOTOGRAPHS, MADE BY THE AERO CLUB OF AMERICA IN THE ARMORY SHOW.

The older method, so far as automobile practice is concerned, of securing partial equalization by running a cable from brake to brake through a hollow shaft with rounded inner corners at the ends and over a crank at each end with an easy curve, is still used to a considerable extent. While this allows fairly good equalization for light setting of the brakes, it will not equalize when the brake is set hard, on account of the friction of the cable in the bends at the ends of the tube and round the cranks. Especially when the bends are as short as on most cars. One or two have easy curves of long radius with correspondingly nearer approach to perfect equalization. It

foot quicker than by hand, especially as both hands are apt to be busy in cases when it is necessary to make a quick stop for safety.

The service brakes are most frequently of the band type placed either on the extension of the main shaft of the engine, the change-speed gear shaft, or the countershaft when the latter is used. One exception to this, however, has the emergency brakes on the counter shaft, and the service brake on the hub. Other and more numerous designs have both service and emergency brakes on the rear wheels, one external and the other internal.

Cooling the brakes has received considera-

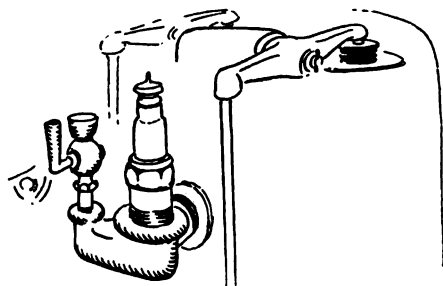
it is allowed to waste either by dripping to the road or becoming vaporized and passing away as steam. It is not applied to the rubbing surfaces since it would make the dripping power variable.

The few cars which have been heretofore using brakes for resisting action which would have to pass through a chain drive with the consequent loss of control of car with the breakage of a chain, have adopted the hub brake with its much higher element of safety.

The rubbing surfaces are ample in size for durability, this being especially desirable when wear and adjustment for allowing for it causes dragging of the brake.

IGNITION PRACTICE AT THE SHOWS.

AN examination of all the foreign cars exhibited at the Armory and Garden shows reveals the fact that only three of them are not equipped with some form of magneto ignition. One of



NORTHERN SPARK PLUG CHAMBER.

these latter is the Aster tri-car, which, however, really belongs to the motorcycle class; the other two are the Daimler and the Napier—both British. An equally significant fact is that each of these cars is equipped with a single coil and distributor,

This seemingly overwhelming indication of the popularity of the magneto abroad is not, however, as great as at first sight appears, since the exhibit is made up almost entirely of the touring car type of machine; there are no runabouts or light voiturines of foreign manufacture in the entire show, nevertheless it is significant. In the matter of low- and high-tension magnetos, the former still seems to be the favorite, although the latter seems to be steadily gaining ground.

On the other hand, while comparatively few of the American cars are equipped with a magneto of any sort, yet the majority of those so equipped use the high tension variety. This is probably due to the fact that as the magneto is comparatively new, most manufacturers prefer to buy the entire apparatus which others have tried and found to be satisfactory, rather than to attempt costly experiments in devising a new type of low-tension make-and-break mechanism.

At present the individual coil system very largely predominates over all others in American practice—in fact, probably more than three-fourths of the cars at the two shows were so equipped.

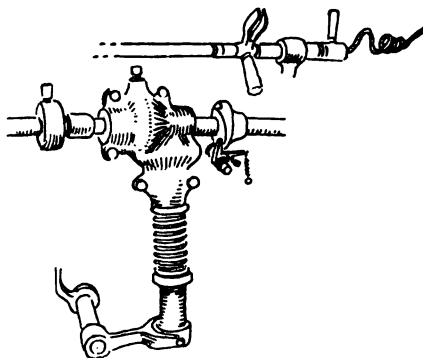
There is, however, a considerable gain in the use of single coils and high-tension distributors, there being at least ten so equipped besides those makes which use small dry cells to energize the magneto coil for starting. A successful use of the distributor this year will probably mean its more general adoption another year.

In the matter of batteries the storage

cell has increased enormously in popularity, and now at least three-fourths of American cars using battery ignition are so equipped, the use of dry batteries exclusively being confined to the light runabout type. Two sets of batteries are provided in almost all instances; some makers on the large and medium-priced cars provide two sets of storage cells; others one set of storage cells and one set of dry cells.

Coils are generally wound so as to be adapted for three-cell storage or four-cell dry, the reason given for this being that a four-cell dry, which is practically equivalent in voltage to a three-cell storage, has a lower discharge rate and is more economical to operate than a three-cell one, which is equivalent to a two-cell storage battery.

As it is not always easy in some localities to get a storage cell recharged, the



DETAIL OF BRASIER BEVEL GEAR DRIVEN IGNITION CAMSHAFT.

six-volt coil is much better in an emergency when it may become necessary to use dry batteries. Some American cars, however, which are equipped with foreign coils, are provided with two-cell storage batteries.

The vibrating type of circuit breaker and non-vibrating coil have all but disappeared except on motorcycles. The lever type of commutator is also disappearing. Commutators of the roller and ball contact type, together with the steel-faced revolving brush type, seem to be about equally popular.

In the matter of the position and location of the spark plug or igniter—whether the low tension or high tension system is used—the practice on both foreign and American cars seems to be overwhelmingly in favor of placing them in the inlet valve pocket or near the inlet valve if the valves are placed in the head. It also seems to be a well-nigh universal practice to place high-tension spark plugs in a vertical position. The manufacturers of the Northern car have gone so far as to design an attachment which screws into the side of the cylinder to hold the plug upright. They

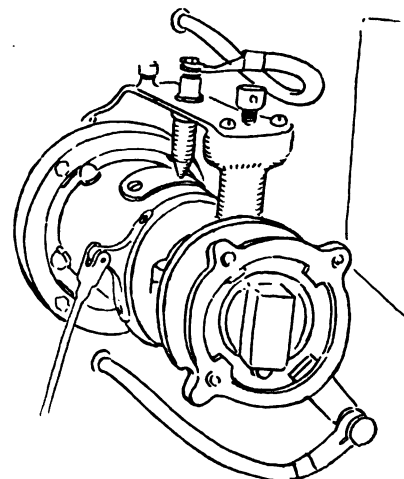
claim for this device that it keeps the spark plug free from oil and adds to the power of the engine by accelerating the rate of flame propagation, for reasons which are outside the scope of this review.

The Mercedes employs a similar device, the electrodes being placed in a small pocket off the inlet valve chamber, which communicates with the chamber by a three-eighth-inch round hole. They claim for this device that it has the following advantages: First, it keeps out oil; second, it reduces the shock of the explosion and does not tend to loosen the plate on which the igniter electrodes are mounted, and third, it adds to the power of the motor by causing a much more sudden ignition of the main charge.

HIGH-TENSION MAGNETO IGNITION SYSTEMS.

High-tension magneto systems may be divided into two classes: The first class includes systems in which the magneto itself is really of the low-tension variety, but which energizes a separate induction coil, thus transforming the low-tension current of the magneto into a high-tension one. The coil, in most cases, is not fitted with a vibrator, but otherwise does not differ from the ordinary coil, with the exception that the primary is of higher resistance than that used on battery coils in order to be better adapted to the current generated by the magneto.

The second class may be called the true high-tension magneto. This class has a primary and secondary winding on the armature and delivers the high-tension current to the motor without the use of a coil. The



THOMAS HIGH-TENSION DISTRIBUTER.

Eiseman is probably the best-known example of the first class. The high-tension Simms-Bosch, of the second.

The Eiseman system is probably the best

known of all systems used in this country, being first introduced on the Panhard in 1903. The system is practically unchanged since then, although some improvements have been made in mechanical details. It is still in use by the Panhard company. The chief characteristic of this system is a normally closed circuit breaker, which keeps the armature grounded until the spark is to be produced, when this "ground" is broken, and the current flows through the induction coil. A distributor is made part of the magneto. The distributor, as on most high-tension magnetos, is mounted on the magneto base. The spark is advanced by means of a slotted sleeve device which alters the relation of the armature to its driving shaft or sprocket. On the Panhard a switch is provided so that batteries may be used for starting, the circuit breaker of the magneto and the magneto coil being used for this purpose. In one type of Panhard the magneto is mounted on a box on the dash and is chain driven, while in an-

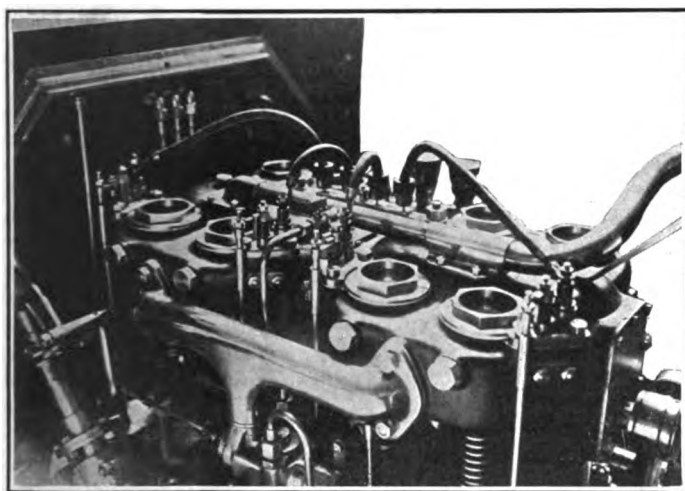
skew gearing. These gears are inclosed in an extension of the crankcase and the magneto is practically made an integral part of the motor. The sparking point is fixed, there being no provision made for altering it. Owing to the fact of this type of magneto having four maximum voltage points instead of two, the distributor is mounted at the other end of the magneto shaft at the left side of the motor, the magneto being almost directly in front.

The Simms-Bosch is also shown in use upon the Leon Bollee car; in this case, however, an individual coil and battery system is provided. These systems are entirely separate, two sets of plugs being provided, one perpendicular over the inlet valves, the other horizontal over them. Both systems of ignition in this case may be used simultaneously or either can be used separately.

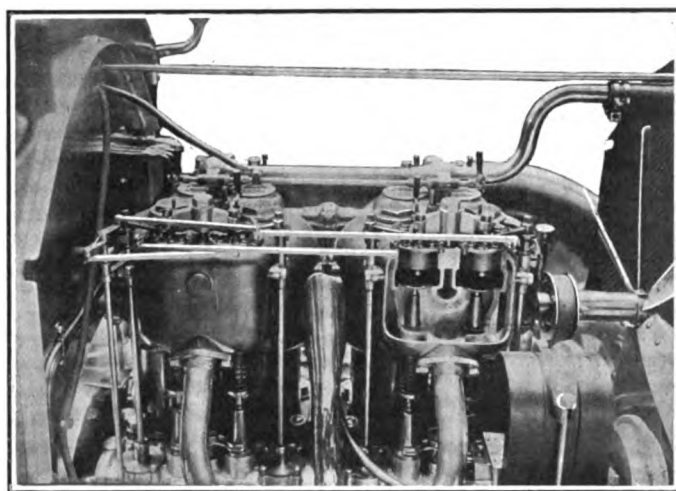
This system is also applied to the C. G. V. in conjunction with an individual coil system. In this case, however, only one set

storage battery. The system is very well thought out, and there are features in conjunction with the use of the two primaries which there is not the space to go into here. In the case of the Decauville, this system is used in conjunction with an individual coil system, there being in this case two sets of plugs, so the systems are entirely separate.

The Gianoli magneto system is shown on the De Leon car. This system employs a high-tension magneto of the second class, with primary and secondary winding. The spark is advanced or retarded by hand by shifting the pole pieces of the magnets. The great peculiarity of this system lies in the use of a magnetic circuit breaker instead of a mechanical one, as in most systems. This is mounted on the armature and is similar in action to the vibrator of a coil. The advantages claimed for this device are: first, the circuit is always broken at slow speeds at the most advantageous point; second, at high speeds it acts as an automatic regulator and prevents burning out of the



ROCHET-SCHNEIDER MAKE-AND-BREAK IGNITION MECHANISM. NOTE TAPPETS OPERATING IGNITERS.



STUDEBAKER MAKE-AND-BREAK IGNITION. NOTE LINK AND LEVER IGNITER OPERATING MECHANISM.

other it is mounted under the hood and is gear driven.

The Eiseman is also applied to the Packard car; in this case it is used in conjunction with a separate vibrator coil for starting, the timing of the battery coil being effected by an entirely separate commutator of the roller contact type. The magneto coil and battery coil are both placed in a box on the dash. A special switch is so arranged as to connect either secondary to the magneto distributor and also make the proper primary connections.

The Simms-Bosch. This is of the second class, having a primary and secondary winding on the armature (which is stationary), a revolving shield being employed as in the low tension type of this make. This magneto is used on the Renault, and the builders show their entire faith in it by discarding batteries, even for starting, and also by their method of driving it. The magneto is placed in front of the motor, with its shaft at right angles to the motor, and is driven from the cam-shaft by means of

of plugs is used, and a special switch is provided to change from one system to the other.

The Simms-Bosch company also makes a smaller type of high-tension magneto with revolving armature and separate distributor. One of these is shown applied to a Clement light car.

The Lacoste magneto is of the second class, with revolving armature. The special points of this apparatus are the excellence of the workmanship and finish, and the careful protection of all parts. It is provided with a very neat, entirely inclosed, slotted sleeve device for advancing the spark. This magneto has been applied by Smith & Mabley on their Simplex cars.

The Basse-Mitchell magneto, a comparatively new one to this country, is shown applied to the Decauville car. This system belongs to the first class, as it has a separate coil. The peculiarity of the system consists of the use of two primary windings to the coil, one for the magneto and the other for use in starting, with a two-cell

armature; third, the spark is automatically advanced. The system also includes a vibrator coil, a combined distributor and timer, which is not attached to the magneto, and a special switch for making the proper connections of magneto coil, distributor, the coil battery and switch being mounted in a box on the dash.

The Remy Electric Company shows its high-tension and low-tension magnetos. Its high- as well as its low-tension magnetos have been adopted by several well-known American makers. The features of this system are advancing the spark by shifting pole pieces, and general care in the design as to the protection of parts. A separate coil is used, this system being of the first class. Batteries may be used in conjunction with this coil for starting.

This magneto is shown applied to the Apperson Brothers car in conjunction with an entirely separate individual coil system, one set of plugs being placed over the inlet valves and the other over the exhaust. On all other makes, however, to which this sys-

tem is applied only four small dry cells are used for ease of starting.

The Holley magneto (Huff system), manufactured by the Holley Brothers, is distinctly original. It is of the first class and uses a separate coil, but in a rather peculiar manner. The magneto first charges a rather large condenser; connection with this condenser and the magnetos is then broken and, instantly following this break, connection is established between the coil and condenser, thus producing the spark by the condenser discharge through the coil. This system presents many interesting features, which it is impossible to go into in detail in this review. It is applied to the large Ford cars, it having been thoroughly tested by the Ford concern for upward of a year.

C. F. Splitdorf, maker of the coils bearing that name, has also placed on the market this year both a low- and a high-tension magneto. Both are of the revolving armature type, the high tension being of the second class with primary and secondary winding. Advance of the spark is by a slotted sleeve device which is very neatly made; in fact, both magnetos present the same mechanical excellence and finish that characterize all of the Splitdorf's apparatus.

The Polyphase Ignition Company shows both low- and high-tension magnetos, which are, perhaps, the most original in the show. The magnets are circular with pole pieces at opposite sides of the cylinder thus formed. The coils of wire in which the current is generated are placed on these pole pieces. The axis of the armature coincides with the axis of the magnet cylinder; it is of a peculiar reverse curved shape, having no wiring on it. The circuit breaker of the high-tension type runs in oil and is positively cam driven in both directions. A transformer coil is used. The whole device seems to be well thought out mechanically and is inclosed in a substantial aluminum case. Ring oilers are used; in fact, the circuit breaker runs in the oil well of one of the main bearings. This oil helps to "hill" the primary spark, thus augmenting the secondary spark.

Out of something like twenty machines, both foreign and American, exhibited at both New York shows, equipped with low-tension magnetos, it is rather remarkable that only one of these is fitted with any other system of ignition. This is an American machine—the Cooper-Hewitt—and is equipped with a single coil and distributor battery system of ignition.

The magnetos used may be divided into two classes, one which employs the revolving shuttle wound armature, and the other the Simms-Bosch type in which the shuttle wound armature is employed, but is held stationary and a shield is revolved to generate the electric current. This latter type has four maximum and minimum current points, and therefore need only be revolved at half the speed of the ordinary shuttle

wound type with revolving armature. The Simms-Bosch seems to be rather the favorite.

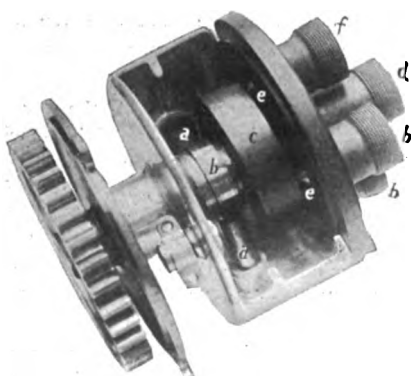
The shuttle wound types differ from each other only in minor details. It has become the general practice to connect the magneto with its driving shaft by means of a jaw clutch or some form of coupling, so that if removed for inspection or repair the magneto can be readily replaced "in phase," that is with its armature in correct relation to the igniter positions.

Most of the older builders, such as the Mercedes, Fiat and Mors, place their igniters in a pocket at the side of the inlet valves. These makers generally operate the moving electrodes by means of vertical reciprocating rods which rise up from the camshaft casing. The advance is secured in various ways: The operating lever attached to the rod is moved across the face of the cam, the operating cam is moved longitudinally, or the camshaft itself is moved bodily.

Many of the makers who have more recently adopted low-tension magneto system, have adopted a form of ignition in which the two electrodes are mounted on one of the valve covers (usually the inlet). In this case the mechanism is operated by a lever on the end of a rock shaft which rises from the crankcase, and is operated by a face cam on the valve camshaft. Advance is secured by raising or lowering this vertical shaft. The Martini and Rochet-Schneider employ this type of mechanism.

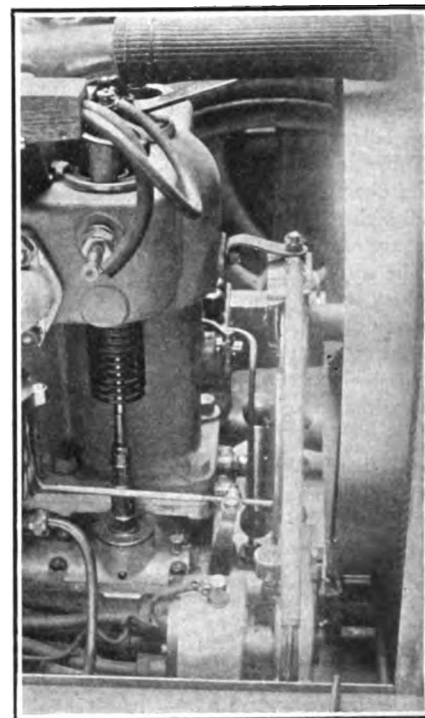
An ingenious modification of this device is employed on the Rainier and Studebaker cars. The vertical shaft revolves and carries a push lever which fulcrums on a movable fulcrum and which is operated by a crank on a disk on top of the revolving shaft. The end of this lever pushes against a pallet on the movable electrode which is connected to the stationary electrode by a spring so as to allow movement of the pallet after the electrodes are in contact.

It will be seen that as the lever moves



SMITH & MABLEY COMBINED DISTRIBUTER AND TIMER WITH CASE PARTLY REMOVED.

a a, woven wire brushes for primary current; b, brass and fiber disk of timer; c, fiber disk of secondary distributor; d, hard rubber bushing for high-tension leading-in wire; e e, distributing points for secondary current; f, bushings leading out spark plug wires.



FRONT END OF S. & M. SIMPLEX MOTOR SHOWING LOCATION OF COMBINED DISTRIBUTER AND TIMER AND WIRE CONNECTIONS TO PLUGS.

forward against the pallet, it will also tend to move outwardly so that it will slip off the end of the pallet. The point at which this will occur depends upon the position of the movable fulcrum and this position is altered by the spark advance lever.

The action of this device is very similar to the mechanism of the Brasier car of 1904. The Brasier car has been radically changed as regards the igniter mechanism on the 1906 models. A camshaft solely for operating the igniter cams is on the left side of the cylinders near the top. Face cams on this shaft operate the igniters by direct contact. This camshaft is driven by means of a bevel gear on a vertical shaft, which rises from the center of the crank case on the left side. The change from starting to running position is made by a slotted sleeve which connects the two halves of this shaft. The lever which operates this is connected with the device which throws the compression relief cams into action to render starting easy. Brazier still holds to his policy of fixed running point for the spark without any adjustment being permissible while driving.

For various reasons the amount of dvance required with low tension spark is much less than with the high tension system; many makers have therefore discarded all mechanism for advancing the spark, as, for instance, Duryea and Mors. Others like Brazier have simply a running and starting position; while still others, as the Fiat and De Dietrich have adopted an automatic advance mechanism. With the high tension system, on the other hand, only two exam-

ples are shown of automatic spark advance; one of these on the four-cylinder Cadillac is supplemented by hand regulation. The other was used in the 1905 model Rambler, and has been discarded on the 1906 four-cylinder model.

The electrical connection between the magneto and the igniters is in most cases of the simplest possible kind; a wire leads from the magneto to a bus bar and from thence it is led through cut-out devices to each igniter. These cut-out devices are used to test the action of each cylinder by suppressing their ignition in turn. In many cases—the Mercedes for example—no method is provided for cutting out the ignition when driving, in case it is necessary to stop the motor, the throttle alone being used. In cases where such a device is provided, it is of the simplest possible description. For instance, in the case of the Fiat, there is on the dashboard simply a brass knob which is grounded, and which, when pressed in about one-fourth, touches the end of the bus bar, thus grounding the current and cutting off the ignition.

While on the subject of low tension ignition, it might be well to mention the Carou system. This system employs so-called magnetic plugs which screw into the ordinary high tension spark plug holes. The energy is supplied by a special type of magneto which is provided with a commutator that distributes the current to the plugs. The action is as follows: When the current flows through the plug, it energizes a solenoid which withdraws an insulated electrode from the ground inside the center, thus causing a spark to be formed.

This system is fitted to the Aster car in

addition to a high tension individual coil system.

SECONDARY DISTRIBUTORS AND INTERRUPTERS.

The practice of using a single coil and distributor, while not as yet common on American cars, does not seem to be losing ground. The Napier Company, which was the first to make a practical success of this method of ignition, is still using it, and the timer and distributor are practically identical with the first models. The distributor and timer, together with the coil, are mounted in a box on the dash and are chain driven. Timing is effected by rocking the brush-holder of the timer and collector points of the distributor about the axis of their respective shafts. The collector points, however, are connected to the secondary leads by a system of brushes, so that there are no moving secondary wires. The timer of this device is of the simplest possible description, consisting of a four-toothed cam-wheel of about 1-2-inch face and 2 inches in diameter and a strip of copper of about equal width, which serves as the brush for the insulated electrode. On the latest 60-horsepower Napier the chain drive to the distributor has been abandoned, and instead a vertical shaft and bevel gear, together with slotted sleeve advance, are used.

The English Daimler also uses a secondary distributor. In this case the shaft is vertical and the distributor is about on a level with the tops of the cylinder heads and toward the front.

The Thomas Flyer was one of the first American cars to use the high-tension distributor. The builders are employing a very neat one of their own manufacture. It is mounted on the dash and has a collector ring around the main part of the distribu-

tor so arranged that the secondary wires do not move. It is driven off the camshaft by means of a vertical and horizontal shaft and bevel gears.

Smith & Mabley also use a distributor. This is placed at the end of a shaft and the secondary cable from the coil enters at the center of the cover. It leads to a radial arm on a thick, hard rubber disk. Points placed in this cover collect the current for their respective plugs from the arm on the face of the disk. The current is led by cables from the points to the respective plugs by cables which pass through bushings whose axes are parallel to that of the axis of the distributor. The timer part of this apparatus is of the woven-wire brush type, with brass contacts and fiber bearing surfaces.

Grout Brothers exhibit a distributor on their car, as also do the makers of the Compound car. In both these cases the Altemus distributor is used. In the case of the Grout car advance of the spark is secured by a slotted-sleeve device. Both makers, however, place their distributors at the end of vertical shafts, well toward the top of the bonnet. This is probably to keep the distributor free from oil or dirt that might tend to cause a short circuit.

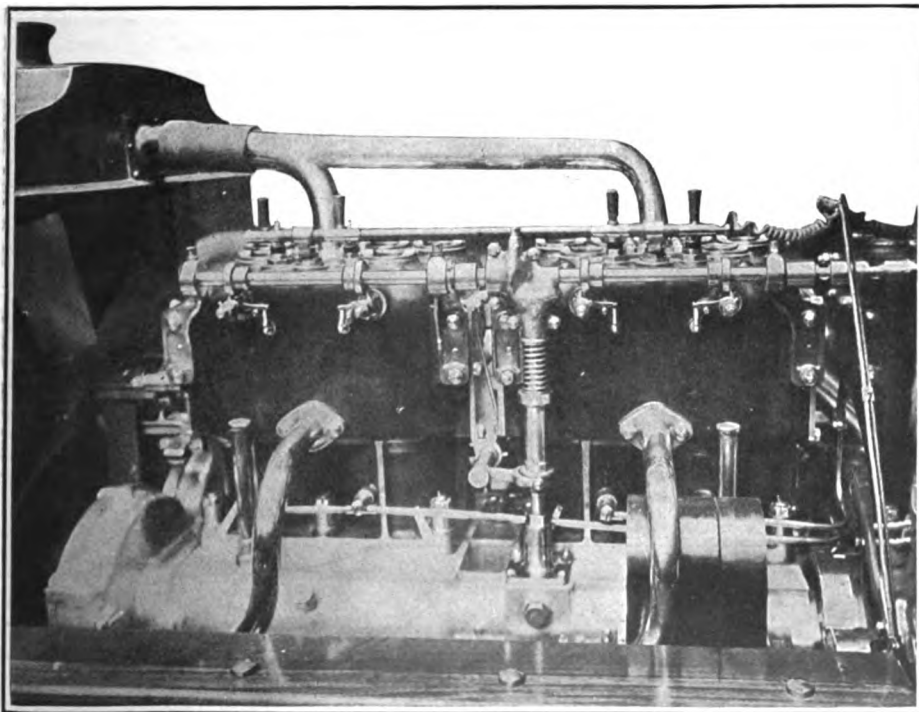
A form of distributor is fitted to the Pullman car, which, to say the least, has the advantage of novelty to recommend it. A shaft extends out longitudinally over the top of the cylinders; this shaft has arms on it, which come into contact successively with light brass strips attached directly to the spark plugs.

The Atwater Kent spark generator is quite an interesting device. It consists of the combination of a distributor, a new vibrator coil and a novel form of circuit closer and breaker. This is so arranged that there is a snap-off action, so that no matter how slow the engine may be running the duration of the contact is always the same and the break is quick and sharp. Furthermore, it is impossible to leave the motor in such a position as to short circuit the battery. The makers of this device claim that it will lead to great battery economy. The mechanism is quite simple, but for want of space a more detailed description must be omitted.

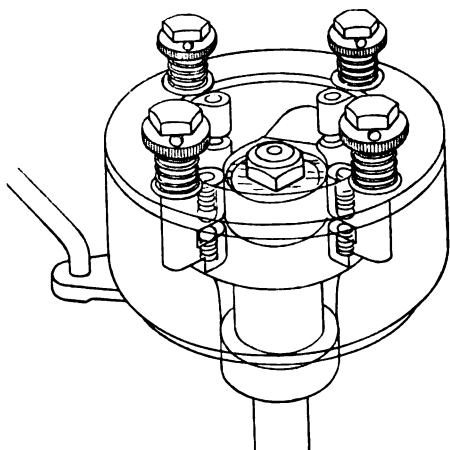
It is hard to say what form of interrupter is most popular. The general principles employed are steel against steel, spring actuated, movable brush, movable brush with stationary ball contacts, and roller contacts of one kind or another. All seem to give reasonably good service and wear well if properly made.

The Uncas Specialty Company, in order to show the adverse conditions under which their timer would work, had two of them running continually during the show, completely submerged, one in a bath of oil and the other in a bath of water.

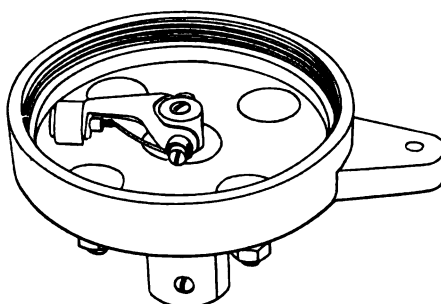
Mosler showed a rather interesting modification of the Crouse-Hinds double-ball interrupter. In this case a roller is mounted on a crankpin



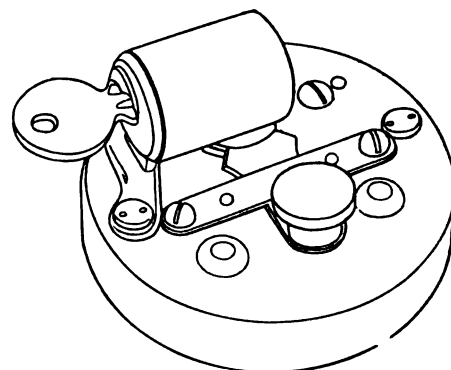
BRASIER MAKE-AND-BREAK IGNITION SYSTEM. NOTE IGNITION CAMSHAFT NEAR TOPS OF CYLINDERS OPERATING IGNITERS BY FACE CAMS



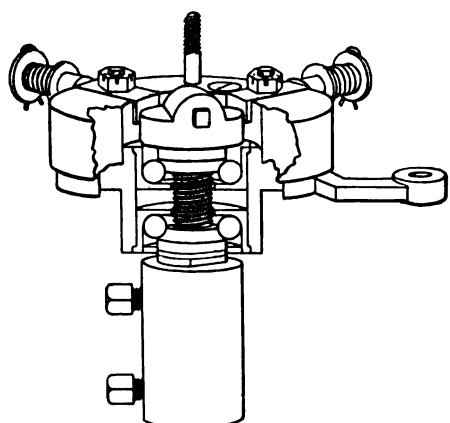
CROUSE-HINDS DOUBLE BALL CONTACT TIMER.



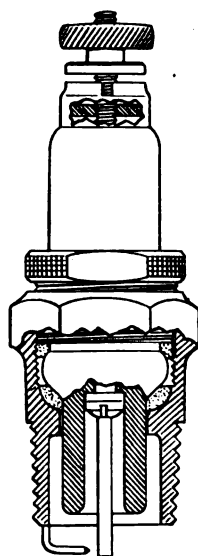
DODGE WIPING CONTACT TIMER.



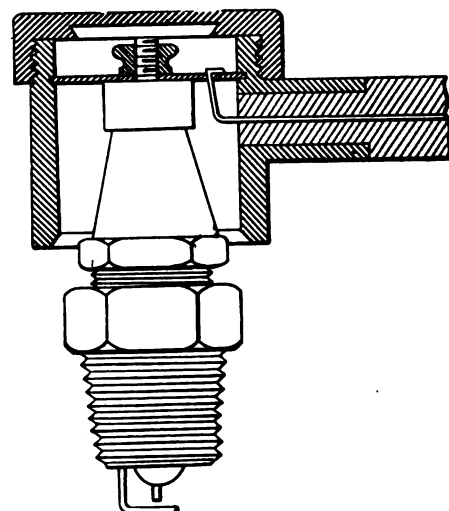
AUTO LOCK PLUG APPLIED TO TWO-WAY SWITCH.



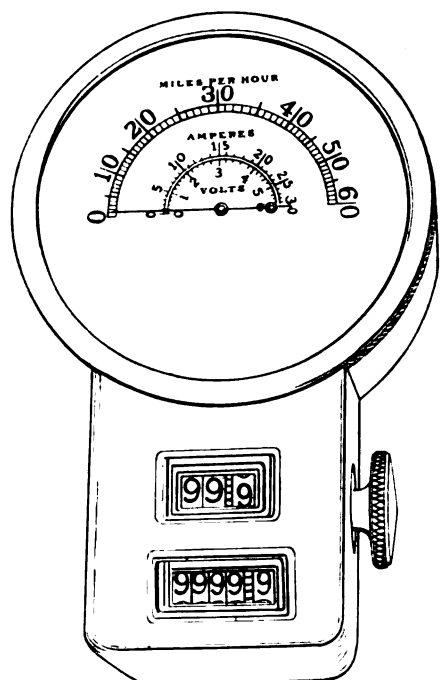
SPLITDORF BALL-BEARING PLATE-CONTACT TIMER.



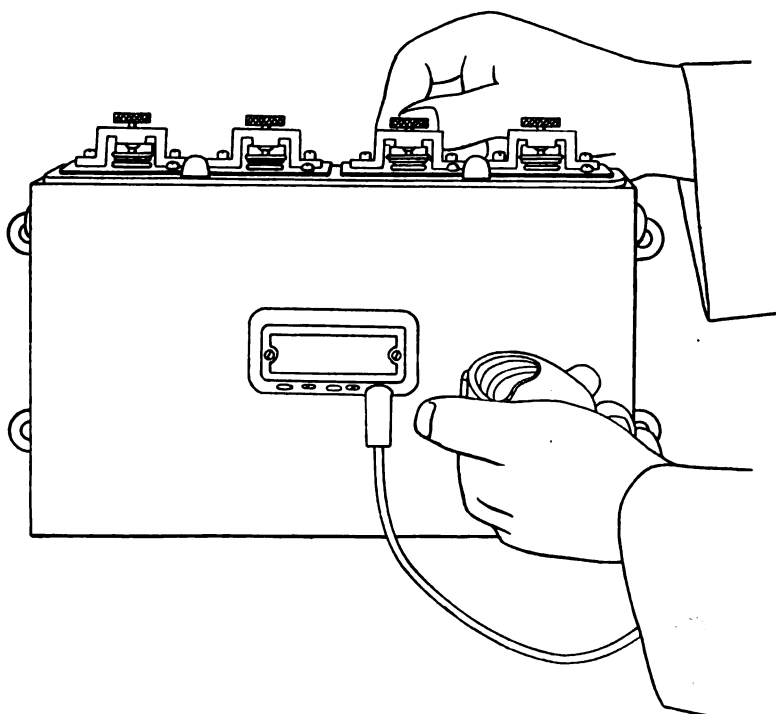
"SOOT PROOF" SPARK PLUG, PARTLY IN SECTION.



STUART MOISTURE-PROOF SPARK-PLUG HAT



LIPMAN COMBINED ELECTRIC SPEED INDICATOR, ODOMETER AND BATTERY TESTER.



CONNECTICUT INDICATING METER FOR MEASURING CURRENT PASSING THROUGH COIL.

with a rather short throw. The current is led to the roller by brushes let into the casing of the device; these are of hardened steel and cushioned by a spring. The roller is about 1 1/4 inches in diameter and the throw of the crank about 1 inch.

Perhaps one of the most novel is the Crouse-Hinds double ball interrupter. In this device at each brush or point two balls are placed with their common axis parallel to the axis of the interrupter; they are held in contact by springs, which are also parallel to the axis of the interrupter. The revolving member is a knife-shaped steel blade, which passes between and separates these balls. To all intents and purposes this is a revolving knife-blade switch. Great claims are made for it on the score of durability, and it would seem likely that these would be borne out in practice.

COILS, INSTRUMENTS, ETC.

In the matter of coils no very startling innovations have appeared at the New York shows. The unit system of construction is now universal in the best American makes. In some cases the coils may be removed from the coil box without disconnecting a single wire, connection being made by springs or contacts on the sides and bottom of the coil box. One maker fits his box with space for an extra unit so that a spare coil is always on hand in case of accident.

The hammer-break type of vibrator seems to be most in favor. Most manufacturers are now working toward producing economical and efficient coils and are doing their best to educate the public in the proper use of them by distributing really helpful handbooks of one kind or another.

In the line of testing instruments, ammeters and voltmeters there are no specially new developments.

The Conn. Tel. & El. Company, however, have produced an instrument which they call a "coil current tester." This is nothing more or less than an ammeter which can be connected in series with the coils when the motor is running, and this enables the operator to measure the current consumption.

Another ingenious idea is the Lipman speed indicator. It is principally a device for measuring the speed of a machine, and consists of a small alternating current generator mounted on the steering knuckle of the front wheel, connected with a voltmeter mounted on the dash, the meter being graduated in miles per hour. There is, however, another scale on the instrument, and by means of a cord, which can be plugged to the instrument, one can readily measure the voltage or the amperage of the batteries, as the case may be.

In the matter of spark plugs, the soot-proof type, with long tape-ing insulation protected by the casing of the plug, seems to be the prevailing type. Porcelain seems to be still in the lead, but mica seems to be gaining in popularity as the insulating material of the plug. The general tendency in the improvement of plugs is toward refine-

ment of detail, such as the use of paper-asbestos copper gaskets instead of asbestos string packing.

A novelty in the plug line was the plug exhibited by the Duplex Ignition Company. This, to all appearances, was an ordinary plug with the exception that a wire projected through the insulated terminal and terminated in a small, hard rubber rod above this. Upon dipping a piece of string into water and tying it around the spark points, for trial purposes, the plug was completely short circuited; however, on withdrawing the wire about half an inch the spark jumped the gap as readily as ever.

In the matter of dry batteries perhaps the most notable novelty was the Columbia reserve dry cell. This cell is so constructed that it may remain unused any length of time under reasonable conditions and will not deteriorate. It is, however, necessary to add water to render the cell active.

In the matter of storage cells the same finality seems, for the present, to have been reached and makers are striving to turn out a good serviceable article.

Most of the makers are supplying a simple charging set consisting of a cluster lamp holder for three lamps, at a nominal price, and invariably they supply handy little instruction books on the care of batteries.

In small fittings a number of minor novelties were shown, such as clips and connectors for batteries, and snap connections of one sort and another for quickly connecting or disconnecting plugs. A device shown by various makers under different names, such as "hat" and "protector," consisted of caps which fitted over the spark plug to protect it from rain, spray, or other moisture. These are, perhaps, more useful for marine and motorcycle work than for the automobile.

Dashboard switches were shown in endless variety. The detachable lever type seems to be gaining somewhat in favor. Rubay showed a Lacoste high-tension switch for changing over from magneto to battery ignition. Several so-called "lock switches" were shown fitted with Yale keys, so that they could not be tampered with when locked with the ignition circuit opened.

New Ideas in Tires and Wheel Rims.

IN tires, the same as in every other branch of the automobile industry, the last twelve months have seen great advances made, and these were manifested in the interesting exhibits of the tire manufacturers at both the Madison Square Garden and Armory shows. To the visitor making a round of the various booths it was evident that, now that the manufacturers have been successful in making a tire that will "stay put" on the wheel and give reasonable service, they have practically united in diverting their energies from the pursuit of a puncture-proof rubber-and-fabric tire, and instead have devoted their efforts to simplifying and improving the construction of rims in order to facilitate the removal and replacement of tires when the possible puncture occurs.

Really, it was not the fact that a tire deflated when punctured and had to be re-pumped that harassed the ordinary motorist, but the knowledge that in case of mishap he had ahead of him half an hour's hard labor in a fight with lugs and to get the bead of the tire out of the rim channel with scarified hands and inadequate tools. And then when the old tube was out and a new one in its place, there was the ever-present danger of pinching the tube when the tire was forced back into place again. Many an automobilist has perspired in getting tube and shoe on the rim, lost his wind in pumping up the tire, and finally tightened up his lugs, only to ride a block or two and have the thing go flat again with a pinched tube.

Realizing that the puncture bugaboo was driving many automobile users to pedestrianism, and still others to the use of solid

and semi-solid tires, the manufacturers of pneumatic tires set about to devise a quickly detachable rim that would at once be inexpensive to manufacture and attractive to the user as a time saver. The result is that several of these new rims are now offered to the public and are meeting with ready sale. Many drivers believe that they will do more toward popularizing the use of automobiles than any one other thing, because they will give to the users a sense of comfort and a freedom from the dread of punctures that will be at once pleasing and encouraging.

The manufacturers of solids, in the mean time, have given some attention to pneumatic tires. The Firestone people show a new line, and the Swinehart company manufactures a single tube tire which is practically an enlargement of the single-tube bicycle tire, so constructed that it may be run flat without rim cutting. This result is obtained by placing the entire air chamber above the rim, and in case of puncture the tire is repaired with a large rubber plug which is cemented in place.

In tire sections the American manufacturers have followed the lead of the foreign makers and are now turning out numbers of flat tread tires. The advantages claimed for these are that the tread, being heavier, resists punctures and road bruises better than the old type round tread, and that the tire, by reason of the wide flat tread, secures better traction and wears more evenly.

Tire protectors galore appear at the various booths, many new and original ideas being shown. A favorite type is a new cover made after the pattern of a

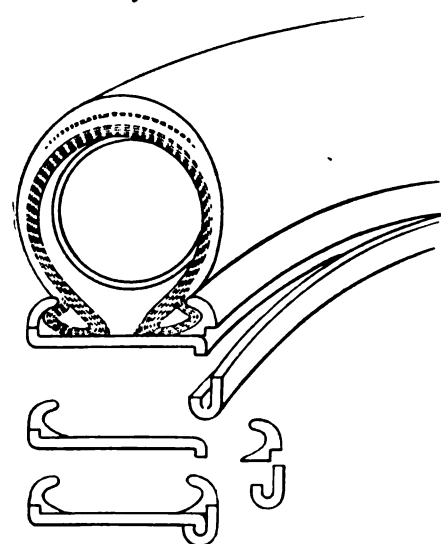
complete tire which is turned out in a size slightly smaller than the tire it is to go over. The tire to be covered is deflated. The cover is placed over it and when the air is pumped in again the cover is held firmly in place without any clamps or other fastenings.

Non-skid treads and devices of all sorts numerously appear and almost every manufacturer of tires has a new type to show. It is evident that this most important question of skidding has been given the thought and attention that it deserves, and the result is the appearance of a number of simple and apparently efficient devices. The Bailey non-skid tread is a leader among these, and there is no end of others which are claimed to be equally as desirable and efficient. The tire manufacturers have at last realized that something must be done to prevent skidding if the auto is to be an all-the-year-around machine.

A tire made completely of leather, with the exception of the inner tube and fitted with non-skid pegs, was one of the newest show features. The manufacturers guarantee this for a year against rim cutting or blow outs.

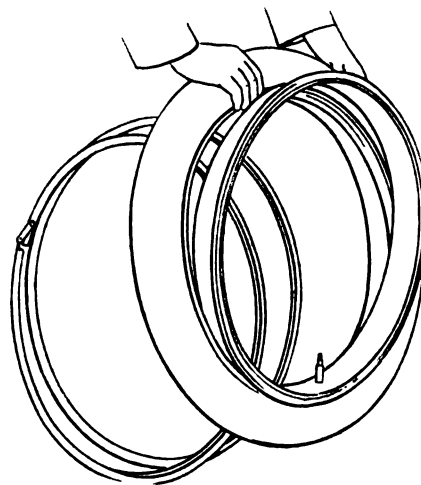
All along the line the manufacturers have increased the weight of tires and are seemingly using greater care in the selection of materials. The buyer in 1906 will not only have a greater selection to choose from, but he will receive the greatest value for his money that tire manufacturers have ever offered. If he so desires he may have his car equipped with a set of tire covers to go over the new tires and by this means may run indefinitely without even allowing his tires to once touch the road. First cost has not been reduced. In fact in many cases it has been increased, but the purchaser gets better material, better design, and will surely get better service. With the tire troubles minimized, if not eliminated, automobiling will indeed possess charms of greater attractiveness than ever before.

An entirely new tire cover with non-skid



MARSH DETACHABLE RIM SHOWING DETAILS AND RING SECTIONS.

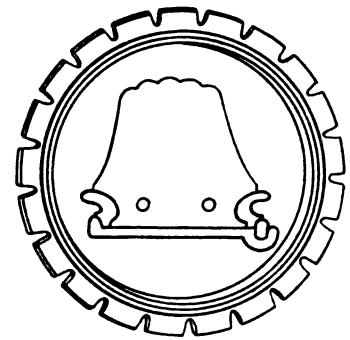
device was shown by the Diamond Rubber Co. It is known as the Burnham protector and is made in the ordinary wrapped tread, Bailey tread, special bar tread, or with the leather and steel stud tread. These covers are slightly larger than the tire they protect and are placed on when the tire is deflated and as it fills out are held in place by the pressure against them. The protectors have been tested out in the West and are shown for the first time in New York. The company did not decide to exhibit until the last moment and had no printed matter descriptive of its product to offer. The Diamond people, besides their regular line of tires, displayed several types of side-wire solid tires for commercial vehicles. They also exhibited and demonstrated the Marsh rim, which is one of the many quickly de-



COMPONENTS OF MARSH DETACHABLE RIM.

tachable rims shown. It may be adapted to any wheel and it is claimed reduces the time necessary to get an inner tube out to one minute. It is impossible for the tire to creep or to be dragged from the rim. Neither will it "rim cut" if run flat after a puncture. The accompanying sketches give an idea of the design and method of using the rim.

The new diaphragm tube is a 1906 product of merit and originality. It is in reality two inner tubes in one with valves placed at either side of the wheel. When one tube is inflated the other is pushed up out of the way so that it cannot be pinched. In case of a puncture the nail or other foreign matter is removed and the second inner tube is blown up, it being intact. The car may then proceed without the delay of removing the shoe to replace the inner tube. The Goodyear Tire & Rubber Co. showed a full line of wrapped tread, pneumatic tires for automobile use. The Goodyear detachable tire and Universal rim are specialized. This new rim consists of a single flat steel band rolled to shape and adapted to fit any wheel with a wooden felloe carrying standard clincher tires; two removable (endless) steel flange rings, adapted in contour on one side to engage



GOODYEAR CORRUGATED TREAD SOLID RUBBER TIRE, ON GOODYEAR DETACHABLE RIM.

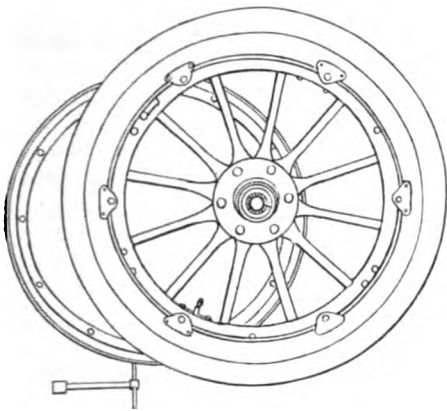
the ordinary clincher type of tire, and on the reverse side for the improved Goodyear detachable tire; and an open steel locking ring which locks the flanges in position; the whole rendered rustproof by galvanization.

The new endless solid tire with scalloped tread was shown and claims made that it is possessed of considerable resilience. The scalloped tread, it is pointed out, allows expansion in four directions, absorbing a considerable part of the road jar. The tire is recommended for commercial vehicles.

This company is particularly enthusiastic over the new Heine non-skid tread car, which came out only a few days before the opening of the show and was offered on the market for the first time. The feature of the tire is claimed to be the fact that it is an absolute non-skid tire and the only one so devised that it does not detract from the resiliency of the tire, but in fact adds to it. The tire is of the usual construction with the exception of the tread, in the center of which are small steel caps sunk in round depressions at regular intervals around the periphery of the tire. These steel bolts grip on muddy asphalt or hard roads and prevent skidding, and it is further claimed that on clay or mud roads additional traction is secured through the suction of the circular depressions in the tread of the tire, in the center of which the steel non-skid pegs are found. These pegs as worn out may be replaced either singly or in strips of a half dozen or more.

The well-known tires of the B. F. Goodrich Co., with tough Goodrich tread and integral construction, were exhibited in all sizes and with the usual non-skid treads. Also a line of tires for commercial vehicles known as the "Goodrich endless side-wire motor tires." The Goodrich quick detachable tire and rim also attracted visitors. It has already been illustrated and described in these columns. It has all the desirable qualities of other rims in preventing creeping or rim cutting, pinching of the tire and in enabling a tire to be promptly and easily removed.

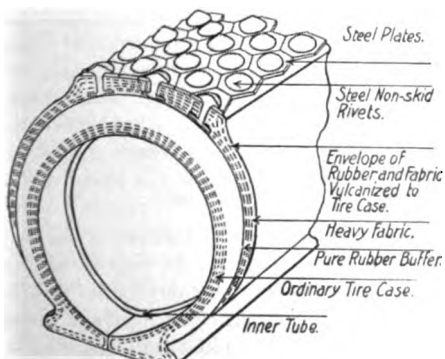
The specialty of the Hartford one-vulcanization wrapped tread tire fitted to the Hartford Universal rim was demonstrated by the Hartford Rubber Works Co. Its most novel and practical feature is the



FIRESTONE MECHANICALLY FASTENED PNEUMATIC TIRE.

floating ring, an endless band made of light metal heavily coated with zinc to prevent rusting. This band has sufficient allowance over the diameter of the rim at the tire seat to insure ease in placing the tire and floating ring on the rim in one operation, the ring being practically part of the tire. When the tire is in place its inside edges bear against the outside edges of the floating ring. Then, when the metal bead is drawn down into the gutter by means of the turnbuckle, it wedges against the outer wall of the casing and prevents water entering the tire. In addition to sealing the tire, this floating ring is in effect an endless lug. It is claimed that a tire may be ridden flat for miles and will not rim cut. The rim is fastened with the usual turnbuckle. It is reversible, so that either the Hartford Dunlop or any clincher tire may be used.

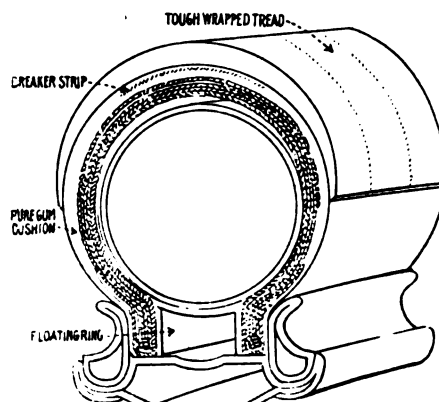
The H. & F. Mesinger Co. exhibited the Mesinger pneumatic leather tire, which is guaranteed for six months against rim cuts or blow outs. This tire is a new departure and is constructed entirely of heavy oil-finished, chrome-tanned leather, which is exceedingly tough and pliable. Absolutely no rubber or fabric is used. The different layers are cemented together with waterproof cement. The tread is formed of leather disks cut from heavy stock. Each disk is fastened with three screws of special design, which are screwed with cement into the solid leather and can be renewed when worn. A specially constructed rim is furnished with this tire which fastens the tire to the rim by a steel band that is contracted or expanded by the movement of one nut with the toggle spanner.



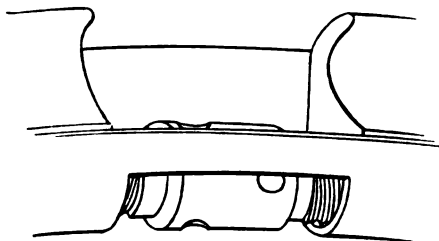
POST "COAT OF MAIL" TIRE.

A tire protector which is original, inasmuch as no leather is used in its makeup, was shown by the Post Manufacturing Co. This protector is known as the "Coat of Mail," and is an envelope of rubber fabric and small steel plates that fits around the tire like a glove and is vulcanized in position. It is claimed to be absolutely unpuncturable and non-skidding.

Wrapped tread clincher tires in all sizes were shown by the Pennsylvania Rubber Co. This concern does not use quick detachable rims, and claims that the bead of its tire is so constructed that the danger of rim cutting is reduced to a minimum. There was also shown a new flat tread racing type with non-skidding properties—the latest product. It is patterned after the flat tread tires used so extensively



HARTFORD ONE CURE DUNLOP TIRE.

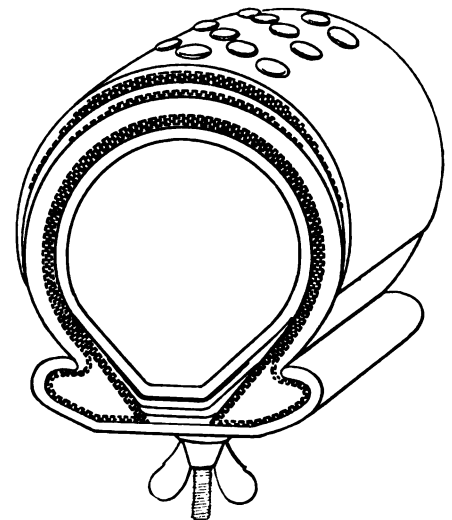


HARTFORD RETAINING RING TURNBUCKLE.

abroad. There is a 3-inch tread which, it is claimed, will act as a great preventative of skidding, even after the corrugations are worn down on the tire.

Morgan & Wright exhibited tires for every sort of automobile use. They maintain that their tires are not only of wrapped tread construction, but are wrapped tires wholly cured in open steam, a process which prevents the wrinkling of the fabric with consequent troubles. This maker also furnishes the Bailey non-slip tread as the non-skidding specialty. The Morgan & Wright Dunlop was also shown with special quick detachable rim of the concern's own make. Apart from a general strengthening of their tires and the continued use of the high-priced materials, they have not departed from the 1905 types.

Fisk mechanically fastened tires in all sizes were shown by the Fisk Rubber Co. This tire is bolted and clamped to a flat rim so that "rolling" or "creeping" is obviated. All the air space is above the rim, and the

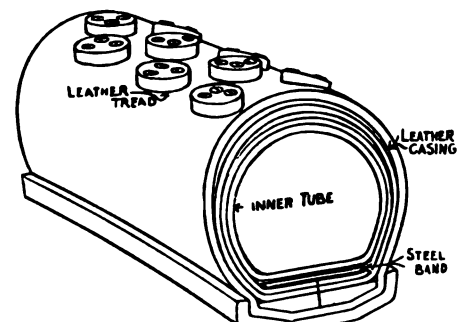


CONTINENTAL NON-SKIDDING TIRE.

tire is guaranteed against rim cutting. Neither can it fly from the wheel when either inflated or deflated. It is also impossible to pinch or injure the inner tube after a puncture has occurred. The tire was shown with the Bailey non-skid tread as well as the standard Fisk treads.

The Firestone Tire & Rubber Co. presented an innovation in the way of a pneumatic tire which is likely to be popular. It is known as the Firestone mechanically fastened pneumatic tire. It is built up with successive layers of fabric and rubber. A wire cable is inserted in each edge of the tire and the layers of fabric pass around these cables, which insures the holding of the tire rigidly in place. Non-corrosive clips are riveted to the tire at regular intervals, with rivets which have large, smooth heads. The felloe bolts pass through these clips as well as the felloe and side flanges, insuring rigidity when the tire is in place. The tire cannot creep or rim cut. The illustration shows the rim removed.

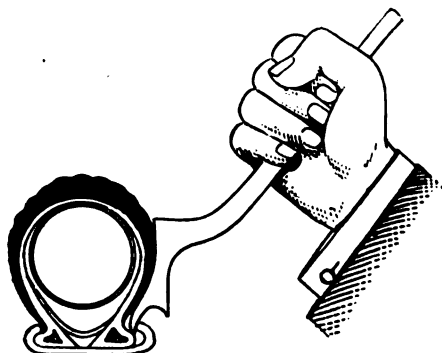
The Continental Caoutchouc Co., importers of the "Continental" German tires, claimed the distinction of having the greatest number of sets of tires on cars on view at the two shows of any tire concern exhibiting. A large variety of sizes was displayed, including the original flat tread racing tire. A new steel studded non-skidding tire was shown and recommended for city use on slippery pavements and for general winter use. It is of original design, with steel studs set in the tire tread, as shown in the accompanying illustration.



MESINGER PNEUMATIC LEATHER TIRE.

The G & J Tire Co. showed its usual line of complete tires and parts, and also exhibited the regular tire moulded in circular shape with the non-skid corrugations. Nothing particularly novel has been brought out, the advancement of the year having been made along the lines of heavier tires and improved processes of manufacture.

Samson leather tires were exhibited by the New York agents in two styles, one being the familiar light type tire, which is simply the body of an ordinary rubber tire to which a Samson leather protector or



LARGE G & J TIRE TOOL.

tread has been applied. The other is the new "Type Course" tire, which is claimed to be the strongest in the world. It is warranted not to affect the resiliency of the tire and, besides preventing skidding, is practically puncture proof.

The International A. & V. Tire Co. showed the Fox brand tires and inner tubes in all sizes. In International tires the fabric is coated both sides with pure Para cement and the layers of fabric separated by pure gum, so that one ply of fabric cannot rest on the others. This internal cushioned construction is claimed as an exclusive feature, and has been successfully used for years.

The Swinehart Clincher Tire & Rubber Co. exhibited many standard styles and sizes of solid tires for pleasure and commercial vehicle use. The company claims a record of 2,000 sets of solid tires for last year, which it hopes to exceed in 1906. This manufacturer is getting out an entirely new pneumatic tire which will be a huge edition of the old single-tube bicycle tire. The entire air space will be above the rim and the tire may be run deflated without rim cutting. When punctured a large rubber plug will be used to repair it, much the same as the old bicycle tires were repaired. This tire will soon be on the market, and although the Swinehart company does not advocate its use in preference to solid tires, they appreciate the demand for a pneumatic tire and intend to meet it.

The Voorhees Rubber Mfg. Co. exhibited a complete line of non-puncturable cushion automobile tires, made after the same patterns that have been used for the past three years. The tire is guaranteed not to come off the rim, being fastened with a patent wire binding.

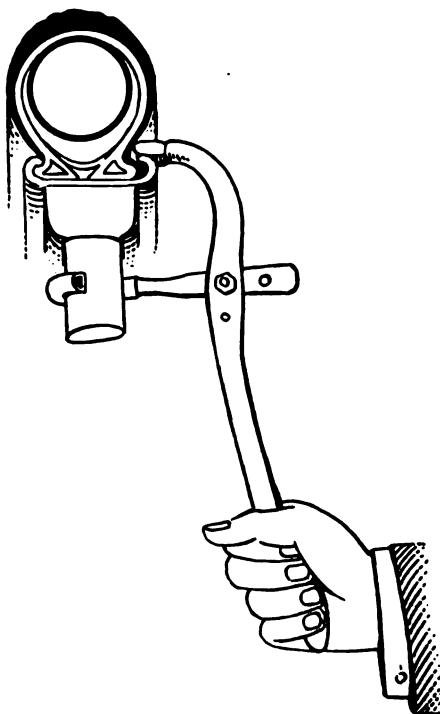


TREAD OF S & M HERCULES TIRE.

An interesting display of the Hercules anti-skid tires was made by Smith & Mabley. This tire is designed to prevent punctures, blow-outs and skidding, and is withal resilient. Rubber is used as a basis for the tire, and several thicknesses of tough linen fiber are used, being moulded directly into the rubber. Attached to the shoe and forming the tread is a strip of rawhide varying in width in accordance with the size of the tire. On this strip of rawhide stand two or four rows of pyramidal projections of specially hardened steel. Each pyramid is made of a single piece of steel, including the shank, which penetrates the strip of rawhide and is fastened inside of the rubber shoe itself. By this means, so long as there is a particle of steel projecting beyond the surface of the tire, it is fastened as securely as it was in the first place.

Solid tires moulded from rubber were shown by the St. Johns Rubber Tire Co. These are formed to fit standard clincher tire rims, but with nearly flat tread. The cushion feature is obtained by forming the tires with large transverse holes passing entirely through the tire between the tread and the beads. In the auto tires these holes are circular, while in the bicycle tires they are in the form of elongated slots. The auto tires are made in sizes from 28 by 2 1-2 inches to 34 by 4 1-2 inches.

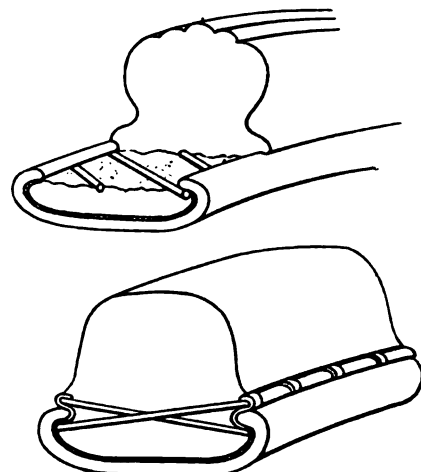
The Mitchell tire, shown by the Mitchell Punctureless Pneumatic Tire Co., is made for use on a special steel rim having a deep annular channel in which is set a pneumatic tire without the usual canvas tread. On the periphery of this air cushion rests a series of solid rubber blocks or "legs," slidably



G & J RELEASING TIRE TOOL.

held between two channel rings bolted to the inner edges of the rim. These channel rings clamp and hold the beaded edges of an outer tire or tread of semicircular section. The solid rubber leg or block is in contact with the inner face of the outer tire. By this construction there is a combination of the non-puncturing quality of the solid rubber tire with the air cushion of the pneumatic tire.

Solid clincher tires for pleasure cars and commercial vehicles were displayed by the



MOTZ STEEL WIRED SOLID TIRES.

Motz Clincher Tire & Rubber Co. This tire is secured to the rim by steel wires which go all the way across and so practically make the tire integral with the rim.

An exhibit of the Fawkes airless clincher tires included solid tires especially adapted to light truck and delivery wagon service.

A peculiar situation, the settlement of which is awaited with considerable interest by the importing trade and the patrons of that branch of the automobile industry, has developed with reference to the Mercedes line. Visitors at the New York shows were somewhat surprised to find the 1906 chassis of the Mercedes exhibited at the Armory, instead of Madison Square Garden, where Smith & Mabley, Inc., who have heretofore sold this car, were also showing some Mercedes machines. Inquiry at the offices of the Mercedes Import Co., Broadway and Forty-second street, elicited the following official statement from that corporation:

"We have a fifteen year contract with the German makers, and we have the cars. In the future we will do all our own selling to the customer direct at retail, and will make deliveries from our new salesrooms."

Smith & Mabley, Inc., when asked for an expression on the situation, stated that they did not wish to issue a statement at the present time.

Don't imagine that because a car will run for perhaps a whole season without a breakdown that it is immune from trouble. Do not let this prevent you from continuing to exercise care and common sense in its management.

Additional Car and Chassis Descriptions.

IN the report of an exhibition of such vast proportions and of such a comprehensive nature as the New York shows a few complete cars and chassis must of necessity fail of inclusion in the first round of examination and discussion.

This is due not merely to the delayed arrival of a number of exhibits, but also to the unprecedented demand for attention on the part of the prospective purchaser who has this year more seriously than ever before closely inquired into the fine points of material and construction.

While this fact rendered the task of obtaining first-hand information regarding the exhibits more difficult than ever for the pressmen to secure from attendants at the booths, the desire on the part of the public for an intimate knowledge of the mechanism of the automobile is an excellent sign. There are no longer such broad inquiries as relate only to color and upholstery, though these details of finish are by no means overlooked. The change has come in the way of an appreciation rather of the vital organs of the self-propelled vehicle, and the average visitor at the shows knows what he is talking about and understands what he is told.

In all cases the car or chassis descriptions which follow may be accepted as authoritative, such data as are given being obtained from personal representatives in attendance at each exhibit.

WESTINGHOUSE COMPANIES.—A beautifully finished chassis built in the factory of the Société Anonyme Westinghouse, at Havre, France, was one of the features of the Armory show. This concern, which is a part of the Westinghouse interests, has been seriously investigating automobile construction, and the chassis was constructed after designs by Albert Schmid, consulting engineer and a director in the French company. Mr. Schmid was at one time superintendent of the Pittsburg plant of the Westinghouse and is a prolific inventor. He has been interested in automobile engineering since the early days of the self-propelled vehicle, and the chassis shown for the first time in this country is an evidence of his skill as a designer of automobiles of the highest class.

The motor, which has four cylinders cast in pairs, is rated at 40 horsepower and has the usual mechanically actuated valves, operated from two cam-shafts; make and break ignition from a low-tension magneto, gear-driven centrifugal pump and flywheel fan. A cellular radiator is used, and the piping to and from the engine is unusually direct. A carbureter of Westinghouse make is used, which has a water jacket with circulation supplied from the piping between the top of the motor and the radiator. This shunt pipe is fitted with a regulating valve so that any desired amount of water may

be allowed to pass through the jacket or the supply entirely shut off.

To provide an automatic auxiliary air supply two inlet valves are fitted to the carbureter, one under tension of a weak spring, to open at moderate engine speeds, and a second under tension of a stiffer spring, to open only on high speeds. The arrangement is claimed to work advantageously under varying atmospheric conditions.

A limiting governor is fitted, which is set to act when the engine speed reaches 1,200 revolutions per minute, but the governor is not interconnected with throttle or accelerator, acting in its limiting function when the clutch is thrown out of engagement with throttle open and spark advanced. Under load on a level the governor is designed to provide a maximum speed beyond which the motor cannot be accelerated.

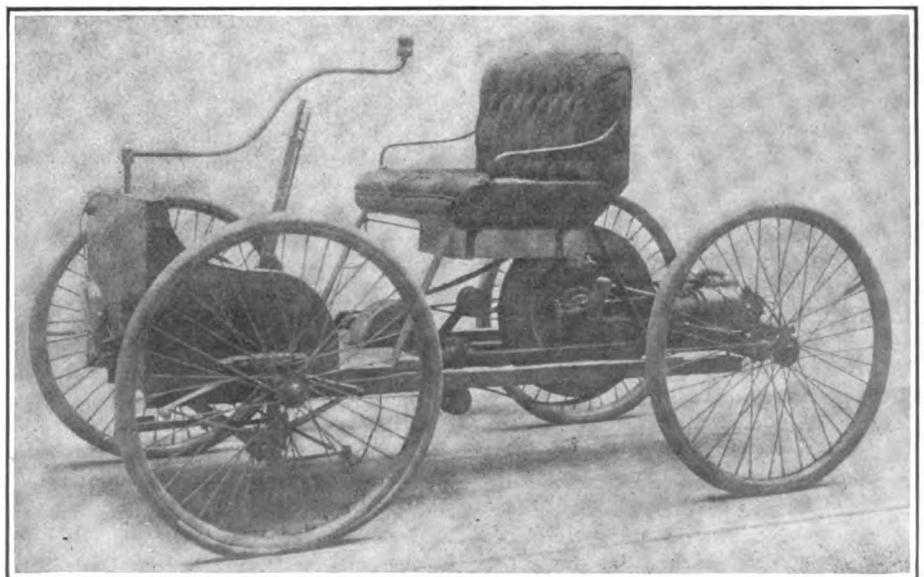
The flywheel is formed with fan vanes, the usual fan in front of the motor being eliminated. A clutch of the multiple disc type running in oil provides gradual engagement of power. The transmission gives four speeds forward and reverse, with drive through one gear on the primary and one on the secondary shaft, with speed changes selectively made by a single lever working in a gate quadrant.

The braking is accomplished by two external contracting, metal-to-metal brakes, one located on the forward end of the secondary shaft, which is extended through the transmission case, and the other on the differential or cross shaft. Both are water-cooled, the water being supplied from a small tank carried on the frame and the water automatically turned on by means of a valve interconnected with the service brake lever rock shaft, which is provided with suitable fingers to raise and depress the plunger controlling the valve. The usual rear wheel emergency brakes are

fitted inside of the drums which carry the rear wheel chain sprockets.

The frame, of conventional type, is of nickel steel and all parts of the chassis are carefully designed with reference to material as well as form and finish, there being a number of special steels of various alloys entering into the make-up of the car. All bearings, except in the engine, are D. W. F. non-adjustable type, and the efficiency of the power plant is said to suffer a surprisingly small loss through transmission to the rear wheels.

DOUGLAS ANDREWS.—As selling agent for the E. W. Bliss Company's new cars, this exhibitor showed in a room in the Armory the first cars made by this big Brooklyn engineering company that were ever publicly displayed. The exhibit consisted of a chassis in rough finish and a big side-entrance touring car with canopy top, the body finish being royal blue with white striping and blue leather upholstery. The pressed frame of these cars is of chrome nickel steel throughout and the I-section axles of drop forged nickel steel. The four-cylinders of the vertical engine are cast in pairs, with integral jackets, the inlet and exhaust valve chambers being on opposite sides of the heads. The bore and stroke are 4 1-2 by 6 inches respectively, and the horsepower 30. A high-tension Lacoste magneto provides current for the jump spark ignition, the distributor being mounted on the front of the dash under the hood. The radiator is of the gilled tubular type and the water pump is driven by spur gears between the rear end of the engine and the flywheel. The same gears turn the camshafts and drive the magneto. The steering gear is directly opposite the middle of the engine below the carbureter, having, as in many new cars, been placed forward of the old position under the dash. A ball governor on the camshaft gear acts on the throttle to control the engine speed.



A RELIC AT THE ARMORY SHOW. THE ORIGINAL HENRY FORD RUNABOUT.

Positive sight-feed lubrication is effected by the aid of a plunger pump actuated by a cam on the rear end of the inlet valve camshaft. The clutch is of the helical spring type acting in the enlarged hub of the flywheel, outside of which the spokes are formed in fan blades. Four forward speed changes are obtained from the unit progressive type sliding gear transmission which has double pinion drive to the cross-shaft. Hess-Bright ball bearings are used throughout the car except in the engine bearings. Internal expanding brakes are fitted on the cross-shaft and on the rear wheel drums, the latter entirely enclosed. An aluminum pan under the engine and transmission protect these parts from mud and dust.

LANE MOTOR VEHICLE Co.—One of the few steam cars on exhibition at the 1906 shows was the Lane, exhibited by this company in the Armory. With the exception of the condenser in front, consisting of a series of vertical flattened brass tubes with an air-deflecting cap at the top of the condenser to throw a current of air down behind the tubing, the car could with difficulty be distinguished from an up-to-date gasoline side-entrance touring car. The finish was drab, with gold and black striping, and the upholstering in red leather, with black leather victoria top. Features characteristic of this car are a semi-flash boiler set under the hood in front, between the dash and water tank, a three-cylinder compound steam engine set in inclined position below the front seat and driving by single center chain to the differential on the rear axle. Improvements for 1906 consist in a change from the King of the Belgians body to simpler lines, changes in the bonnet, placing the automatic water pump outside of the engine case, so that any leakage arising from wearing of the packing will not get into the lubricating oil, placing the tool boxes under the side running board, an aluminum cover over all the valve hand wheels on the dash, and roller bearings on the engine shaft. The gasoline, water and air pumps are all driven automatically by the engine, the air pump, which is located inside the crankcase, having an outside adjustment screw for constricting the passage. All heat developed in the Lane car is kept forward under the hood; one side lever operates the brakes and another reverses the engine, while a pedal on the foot-board actuates the simpling device by which all three cylinders are caused to take live steam from the generator, thereby increasing the power on hills and when starting. The frame of the car is of angle steel riveted together, the wheels are of the artillery type, and the gasoline tank of pressed steel.

R. BERTELLI & Co.—A regular stock 40-50 horsepower chassis of the Zusta car built by the *Fabbrica Italiana di Automobili*, of Milan, Italy, was exhibited by this firm, which has the sole American agency for the Zusta cars. The chassis was shown rough finished. The four vertical cylinders are cast

in pairs with integral jackets. Inlet and exhaust valves are all on the left side of the engine and are mechanically operated by one camshaft located in the crankcase. Make and break ignition is used, current being generated by a spur gear-driven magneto. The same shaft that drives the magneto also drives the water circulating pump. A force-feed oiler on the dash is driven by a belt from the engine. The gasoline is pressure-fed to the carbureter, pressure being taken from the exhaust gas of the engine, while an auxiliary hand pump is provided on the dash for obtaining pressure when the engine is "dead." The gasoline tank is carried under the extreme rear of the frame, as is customary in large foreign cars. The change speed gearing is of the selective type, giving four forward speeds and one reverse, both the primary and secondary shafts of the transmission driving by bevel gears to the countershaft through the differential. Drive is by side chains from countershaft to rear wheels. Internal expanding brakes act on the rear wheel drums, which are all closed in to exclude dirt and water. There is a large constricting band brake on the countershaft. Both front and rear axles are drop forged to I section and have a deep drop, bringing the center of the car close to the ground.

EISENHUTH HORSELESS VEHICLE Co.—Four Compound cars were displayed by this New England concern. The chief distinguishing characteristic of all is the use of an internal combustion engine having two high-pressure cylinders and one low-pressure cylinder of larger bore set between them, all disposed vertically under the hood. The low-pressure cylinder utilizes the pressure of the gases expelled from the high-pressure cylinders on either side. The valve mechanism, which differs somewhat from the usual construction as a result of this feature, was admirably revealed by means of an engine mounted on a stand and driven slowly by a belt running over the flywheel from a small electric motor. The cylinders were sectioned vertically and transverse sections removed from the valve chambers showed their synchronous operation. Aside from the compound engine, whence the trade name of the car is derived, the vehicles exhibited showed no radical departures from accepted practice. One of the machines was a 16-horsepower, side-entrance touring car, finished in rich maroon, upholstered in dark red leather. A model of the 24-30 horsepower machine was shown, with side-entrance phaeton body and victoria top, the finish being maroon, with maroon-colored leather upholstery and black leather top. The 16-horsepower Doctor Compound for physicians' use had a victoria top on a body with piano box rear end for the reception of a case of surgical instruments, a medicine case, extra clothing, and similar articles. The car was finished in black all over. The fourth model shown was a 16-horsepower covered delivery wagon, the body being raised high above the chassis on wooden horses, revealing the

three-speed sliding gear transmission driving to countershaft, from which side chains transmit to the rear road wheels.

KOBUSCH AUTOMOBILE Co.—This concern, newly organized in St. Louis for the purpose of manufacturing a copy of the well-known Mors, was unable to secure suitable space at the Armory and during the show week has had a complete car on view at the Waldorf-Astoria, with an additional machine in commission outside for demonstrations.

The finished car shown is a 35 horsepower limousine, body by Demarest. In a close examination there is not any detail observable which is not an exact copy of the car turned out by the French company. In this connection it may be stated that arrangements were made some time ago by George J. Kobusch, president of the company, with the *Société Anonyme Mors* for the exclusive right to manufacture, under their patents, this well-known car. The materials entering into the construction are imported from the same concerns who furnish these materials to the parent company. In the construction of the chassis the greatest care is exercised to follow the exact methods of the French constructors, and the resultant mechanism is of a high order of excellence.

Pressed nickel steel frame members are used, and steels of special alloys in all vital parts. The engine is an individual cylinder motor with valves on opposite sides, ignition make and break from low-tension magneto gear driven from cam-shaft. Cooling is by usual water circulation through a bank of gilled tubes, with supplementary water supply contained in a tank at the rear of the chassis.

The transmission from the motor is through a speed change system of the typical Mors sliding gear type, but with only two gears driving on the first, second, and third speeds. The secondary gear shaft is fitted with a bevel pinion which engages with a bevel gear on the differential shaft, and for all speeds except fourth drive is through this set. On high speed the primary shaft is locked by means of suitable clutches and the drive is then through the bevel pinion and gear on the primary and differential shafts. The idler for effecting a reverse of the secondary shaft is in mesh only when the change speed lever is placed in the reverse notch on the quadrant, being slidably mounted on its shaft and thrown out of engagement automatically by the action of a helical spring when the reverse is disengaged.

A convenient little detail noticed in the transmission system is the fitting of a man-hole at the side of the case, extending to the bottom and removable for proper flushing of the gears with kerosene or gasoline. A try-cock is also fitted to the case so that the proper oil level may be found and to let a sufficient amount escape in case too much oil has been supplied. Try-cocks are also fitted to the crank case, one to each com-

partment, and their use should minimize smoky exhaust and ignition troubles.

The only details changed in the car from the French model is in an increase of road clearance of 1 1-2 inches and in the use of springs of greater stiffness, and all parts are to be made to gauge interchangeable with the corresponding parts of the Mors.

Three models will be regularly built, a 20 and a 35 horsepower with individual cast cylinders, and a 50 horsepower with cylinders in pairs. In addition, an 80 horsepower chassis will be built to order.

BERKSHIRE AUTOMOBILE Co.—A 20-horsepower Berkshire chassis in the rough and a 30-horsepower, side-entrance phaeton fitted with extension top and finished all in black constituted the display made by this Massachusetts company. These cars follow the French type, having four-cylinder vertical engines in front and pressed steel frames. The cylinders are cast separately with integral water jackets, and the engine with its crankcase is set on a sub-frame that also carries the transmission mechanism. Valves are on opposite sides of the cylinder heads and are all mechanically operated. The water pump is gear driven and lubrication is by gravity feed and splash in the crankcase. The clutch is of the leather-faced cone type, and the change-speed gears are on a sliding shaft giving three changes forward and one reverse. All gear shifts are by one lever; the gears are always in mesh and run in an oil bath. Drive is by bevel gears to the differential on a countershaft and thence by side chains. The crankshaft has five bearings and is drilled with ducts that lead the lubricating oil from these bearings to the connecting rod bearings. Hess-Bright ball bearings are fitted in the wheels, and the springs have supplemental leaves under compression above the longest leaves, the effect being to counteract excessive play of the springs on rough roads. The axles are drop forged.

J. C. WICHMANN AUTOMOBILE GESELLSCHAFT.—One of the late arrivals at the Armory show during the week was a chassis of the 50-60-horsepower Argus car made in Hamburg and Berlin, Germany, and now handled in this country by the concern named. While following the general modern practice of European constructors, this car has a number of novel features. Perhaps foremost of these is a pair of small pumps on the engine for maintaining air pressure on the gasoline and the lubricating oil. The plungers of these pumps are worked through a connection with the valve push rods and when the pressure reaches a predetermined maximum they automatically cease to act. Two auxiliary hand pumps mounted on the dash at either end of the lubricator serve to develop pressure when the engine is dead and there is no air under pressure in the tank. The water circulation is a combination of the thermo-syphonic and pump systems. Two fiber buss tubes carry the high

tension ignition cables across the tops of the cylinders. A double system of ignition is provided, there being eight spark plugs, four for high-tension magneto generator. The clutch is of the helical spring type and is so constructed that when released it keeps the engine from racing until the governor comes into action to throttle the gas. Camshaft gears are mounted between the flywheel and the rear cylinder. The crankshaft bearings are of unusual length both at the rear end and in the center. Lowe ball bearings are used throughout the four speed sliding gear transmission. The reverse pinion is mounted above the gears on the primary shaft and reverse

motion is obtained by pushing the gear lever forward in its H slot. First forward speed is also obtained by a forward push, while the intermediate and high speeds are obtained by pulling the lever back. The spring hangers are bolted directly through the pressed steel side frames and the rear spring horns, instead of being made of a solid forging riveted to the frame sides, consist of a series of spring leaves forming the rear half of a semi-elliptic spring. These horns, besides being downwardly curved, have a lateral bend to bring their rear ends out far enough to meet the rear ends of the semi-elliptic springs mounted on the axle.

Motorcycles and Tri-cars for 1906.

THOUGH a comparatively inconspicuous feature at American automobile shows, the motorcycle was on view at a number of stands in the Armory, the exhibits of this character, including fore-carriage tri-cars, being confined to the Club show, with a single exception.

The Hendee Manufacturing Company, builder of the "Indian" motorcycle, exhibited an ordinary roadster, a two-cylinder 4 1-2-horsepower racer, and two fore-carriage tri-cars, one for passengers and one for parcels.

There have been no radical changes made in the regular roadster. The motor has, however, been increased to 25-8-inch bore and 3 1-4-inch stroke, and is now rated at 2 1-4 horsepower. The tires have been increased to 2 1-4 inches. The drive is of the well-known double-chain type, the motor making 7 1-3 revolutions to one of the rear wheel.

The Thor compensating friction yielding sprocket is used on the countershaft to prevent undue strain on the chain when starting or running at low speed.

The racer is along the same general lines of the roadster, with the exception that the tanks are made smaller to save weight. The cylinders both work on the same crankshaft

and are set at a slight angle to each other. Ignition is by single coil and distributor.

The tri-cars are formed by removing the front wheels and forks of an ordinary motorcycle and substituting the attachment; this entire operation takes about ten minutes for either change.

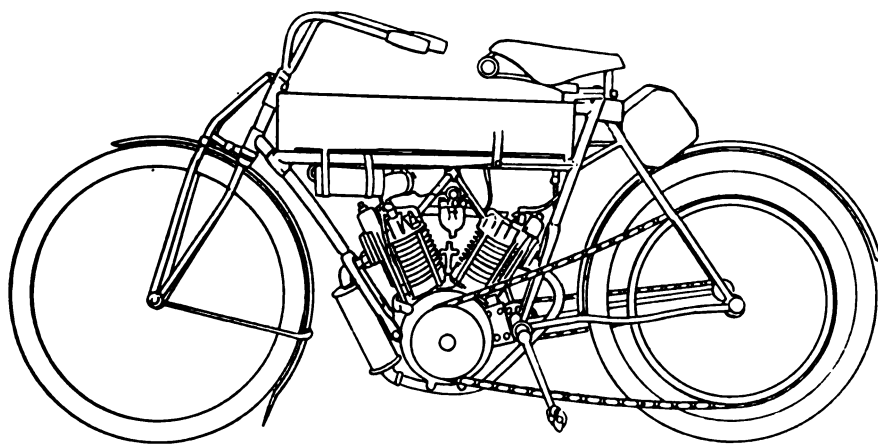
The special features of the Indian are the double-chain drive and yielding sprocket and the double grip control. The right-hand grip first puts the exhaust valve lifter out of action, then turns on the ignition current, and then advances the spark as the handle is turned from one. The left-hand grip is used in a similar manner to open or close the throttle.

The Reading Standard Cycle Company exhibited the "Thoroughbred" motorcycle, also a machine fitted with tandem attachment, and one fitted with a side carriage for a passenger. This machine follows very closely the lines of the Indian, the only difference being the placing of the battery box and the oil and gasoline tanks; the mechanism of the grip control also being slightly different.

The Aster Company exhibited a large 5-horsepower, water-cooled tri-car of a type popular abroad. Drive is by chain to rear wheel; there is a two-speed gear, and the



EXHIBIT OF THE INDIAN MOTORCYCLES AND TRI-CARS IN THE ARMORY.



CURTISS DOUBLE-CYLINDER BELT TRANSMISSION 5-H.P. MOTORCYCLE AT THE SHOW.

motor is started by a crank. If this machine did not have a saddle for the driver's seat it could hardly be classed as a motorcycle, as there are no pedals.

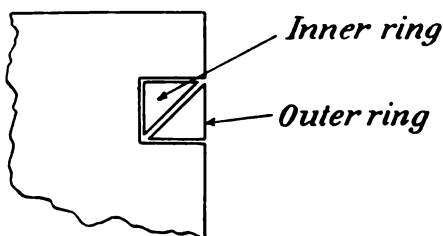
The American Motor Company exhibited a "Marsh" single-cylinder machine, 1906 model. The most conspicuous new features on this machine are a double-valve automatic carbureter, one valve acting for low and moderate speeds, and the other for moderate to high speeds, the use of a ball contact ignition timer, and the addition of a spring fork. The machine is belt-driven, a flat belt being used, slack being taken up by an idler.

The company also exhibited the "Metz" two-cylinder 4-horsepower chain-driven machine. This machine has double grip control, single chain drive with spring idler to take up slack, and compensating friction sprocket on rear wheel. The chain used is a double roller three-fourths pitch, three-eighths wide and five-eighths roller. Ignition is by single coil and distributor.

The Wagoner Cycle Co. exhibited two machines, a single and a drop frame tandem. These machines are similar in respect to motor equipment; the motor is rated at three horsepower; drive is by triangular or V belt, the slack taken up by an idler. The tandem has the drop frame placed in rear.

The G. H. Curtiss Manufacturing Co. exhibited two "Curtiss" machines, a single and a double cylinder. The machines present several interesting features. The motors are furnished with roller bearings to crankshaft. The single cylinder is rated at 2 1-2 horsepower, and the double at 5 horsepower. One of the most interesting points on this machine is the belt used for transmission; this is warranted not to stretch, and the manufacturer shows faith in this drive by not providing the machine with an idler. It is of the so-called 28 degrees V type, but is of rather peculiar construction. There is an outer belt of double thickness, mineral-tanned leather stitched together, having an entire thickness of one-fourth inch. There is also an inner belt of the same thickness. The outer and inner belts are separated by distance pieces one inch long and one inch apart. The whole is united by a large cop-

per rivet passing through each distance piece. This belt runs in a V-shaped groove in the belt wheels which is considerably deeper than the thickness of the belt. The tendency, when a pull is put on the belt, is to crowd down the belt further into the rim, thus making it grip all the harder instead of tending to slip, as with a flat belt.



SECTION OF YALE-CALIFORNIA PISTON SHOWING DOUBLE RINGS.

The only motorcycle at the Garden show was the "Yale California," made by the Consolidated Manufacturing Co. It presents, however, quite a number of interesting features. The drive is by flat belt, and a

neat spring idler is provided, the tension of which may be instantly adjusted without the use of tools.

The motor is conservatively rated at 2 horsepower, being 2 3-4-inch bore and 3-inch stroke. A large outside flywheel is used which conduces to steady running at low speeds. There are four double piston rings used. The construction of these rings is somewhat novel; they are of right triangular section, two placed in a groove so as to break joints. The machine is fitted with a spring fork.

The use of non-vibrator coils with dry batteries for ignition purposes, is the universal practice on American motorcycles. Splash lubrication is also universal, with the use of either sight feed or the introduction of a measured quantity of oil to the crankcase at intervals about equally divided.

Opinion also seems to be about equally divided between belt and chain drive, with the chain gaining in favor. General practice favors motors from 2 to 2 1-2 horsepower, geared about 6 to 1 on the average.

Demonstrations at the Shows.

Twelve months has vastly increased the general knowledge of the buying public concerning automobiles. A careful summarizing of the expressions of representative tradesmen at the recent shows emphasizes this. Time was when a practical demonstration was considered an essential in negotiating a sale at the show; now the demonstration has been relegated to a position of secondary importance as a selling factor.

The number of demonstrating cars in attendance outside both the Garden and the Armory shows was greater than ever, and the same system of making bookings with



DEMONSTRATING A REO RUNABOUT OUTSIDE THE ARMORY AUTOMOBILE SHOW.

prospective customers, and the issuing of identification checks prevailed, but most of the actual sales were made direct from the floor, notwithstanding—the reputation of the selling houses in many instances being responsible for this. The large proportion of those who asked for demonstrations, expressed a desire to test the easy riding qualities of the springs supporting the body, or a wish to test the noiselessness of the exhaust and geared working parts, severally or individually.

From a picturesque viewpoint the array of demonstrating cars was impressive. On three sides of both show buildings, each day, in the early morning, hundreds of machines lined up with military exactness, those on Fourth avenue and Lexington avenue facing toward the center of the street. On the side streets the cars were lined up in single file, one behind the other. The air of bustle and activity, the picturesque costumes of the chauffeurs, the businesslike bearing of both customers and salesmen, lent an air of individuality to the shows and favorably impressed an observing public.

And the business world paused, carefully noted and stored away for future reference the well demonstrated qualities of the commercial vehicles for freight carrying purposes. These important vehicles were never so much in evidence as this year. Fully two score maneuvered all day long on the streets adjacent to the exhibition buildings, carrying various cargoes, from sample loads of pig-iron to boxes of fashionable millinery. All told the same story—efficiency, ease in handling and a ready adaptation to the requirements of the business.

No violations of the speed limit by the operators of the demonstrating cars were reported during the shows. This may be considered a further proof of the perfected education of both the customer and professional driver in the requirements of the law. When the increased number of demonstrating cars incident to two shows is considered, together with the number of out-of-town drivers presumably unfamiliar with local regulations, the fact that no violations of the law occurred is certainly remarkable.

Names of Garden Show Attendants

THE gathering of sales representatives of automobile manufacturers is an annual feature of the shows, and is always looked forward to with pleasant anticipation and long remembered. They come from all parts of the Union, and meet in a fraternal spirit. Among those at the Garden complete vehicle stands were the following:

Auto Import Co.—J. S. Joseph, Benj. Eichberg, John G. Dale, H. B. Hills, Jr., H. A. Conners.

Apperson Bros. Automobile Co.—Elmer Apperson, Edgar Apperson, G. E. Bruner, L. A. Hopkins, Fred. P. Brand, Alex. M. Benson, Geo. M. Brown.

The Autocar Co.—Louis S. Clarke, John Clarke, John Calder, A. H. Whiting, A. L. Goddard, J. S. Stavers, Fred S. Smith, Louis Geyler, Geo. Middleton, Palmer Abbott, Albert J. King, W. G. Brooks, Samuel F. Randolph, Raymond Hitchcock, William Richwine, R. T. Newton, M. J. Wolfe.

Babcock Electric Carriage Co.—F. A. Babcock, C. A. Benjamin, E. R. Whitney.

Sidney B. Bowman & Co.—Clovis Bertron, Victor Villar, Capt. Rawson Turner, Sidney B. Bowman.

Buick Motor Co.—W. C. Durant, H. E. Shiland, W. Kerr, C. C. Coddington, H. J. Koehler, C. Barrows, J. O. Norcross, W. E. Eldridge, F. Stranahan, W. C. Jaynes, Sidney Black, Mrs. Post, H. Fredericks, Chas. Grant, George Grant, C. H. Dill.

Columbus Buggy Co.—Charles E. Firestone, J. Firestone, O. H. Perry, G. M. Bacon, Frank Warfield, J. W. Delamater.

Cantono Electric Tractor Co.—Chas. I. Scott, H. W. Scott, G. Mazagretti, H.

Nicot, Paul de la Chesney, A. Lichtenstadter, W. Thorner.

Cadillac Motor Car Co.—Lem. W. Bowen, A. E. F. White, Wm. H. Murphy, W. C. Leland, H. M. Leland, E. E. Sweet, and twelve members of the mechanical board, W. E. Metzger, J. Elmer Pratt, H. M. Hoblitt, K. P. Drysdale, George Craven, William Krafve, W. C. Martin, Geo. E. Blakeslee.

De Dietrich Import Co.—Walter C. Allen, Chas. Duval, E. H. Cox.

Decauville Automobile Co.—E. S. Partidge, C. F. Wyckoff, Herbert Rose, Stephen Thorn, William Swan, Edward Hayes.

Elmore Mfg. Co.—J. H. Becker, B. A. Becker, W. W. Gawthrop, A. E. Ranney, A. M. Day, A. J. Robinson, N. Davis.

Electric Vehicle Co.—M. J. Budlong, W. G. Henderson, Harry W. Kyte, D. W. Henry, W. H. Durffy, C. C. Barrows, W. W. Burke, Fred W. Nichols, F. E. Dayton, E. C. Bald, J. J. Gaffney, G. E. Risley, George Middleton, Louis Fitzgerald, W. A. Evans, John Crittenden, John Milliken.

H. H. Franklin Mfg. Co.—Alexander T. Brown, W. C. Lipe, H. H. Franklin, H. K. Chadwick, F. A. Barton, John Wilkinson, A. R. Bangs, Percy L. Neal, Fred Pardee, T. P. Howell, H. C. Murray, M. C. Moulton, F. R. Bump, S. J. Marshall, C. E. Wheeler, S. C. Crane.

Gallia Electric Carriages.—Bernard Maurice Dufresne, Count Armand de Gontaut Biron.

Hewitt Motor Co.—E. R. Hewitt, G. W. Phillips, C. L. Cummings, C. O. Snyder, Frank Keegan.

Haynes Automobile Co.—Elwood Haynes, John Haynes, Frank Nutt, C. B.

Warren, C. C. Cartwright, Francis Fanning, John Gibson, E. S. Breed, J. B. Deibler, F. G. Carrie.

Knox Automobile Co.—E. H. Cutler, W. E. Wright, A. E. Smith, H. G. Farr, James Jones, C. R. Culver, Geo. A. Crane, S. A. Miner, Frank Billings, George Reed, A. P. Underhill, H. E. Bradford, O. F. Springer, G. R. Hunnewell, Chas. Brewster, R. W. Blake, A. G. Grundler, E. A. Hale, Chas. Van Stone, F. L. Thomas, John Collins, H. M. Davis, C. H. Martin, George Kerr, R. T. Allcutt.

Locomobile Company of America.—S. T. Davis, Jr., A. L. Riker, Thomas H. Thomas, E. F. Russell, A. W. Robinson, M. V. Doud, D. C. Carson, I. J. Morse, J. H. MacAlman, A. J. Banta, K. M. Blake, J. F. Plummer, J. A. Kingman, G. A. Knowles, H. W. Lincoln, C. E. Scott, J. A. North.

F. A. La Roche Co.—Ralph Temple, Wm. Hyslop, Wm. Kearney, Ernest D. Nevin, C. D. Cook, Henry Mehl, George Debecker, Geo. M. MacWilliam, Samuel H. Shaw, William Murphy.

Matheson Motor Car Co., Ltd.—F. H. Matheson, C. M. Matheson, Henry U. Palmer, Charles Singer, Charles R. Greuter.

Northern Mfg. Co.—W. T. Barbour, G. B. Gunderson, V. M. Gunderson, Chas. B. King, Clinton Hunter, McKie Walker, Peter Fogarty.

Olds Motor Works.—Henry Russell, Fred L. Smith, Angus Smith, George Dunham, R. D. Chapin, R. B. Hamilton, Frederick Sager, C. H. Larson, Gen. John T. Cutting, Robert Phelps, F. Stokes, R. Jackson H. E. Coffin, W. O. Adams, R. R. Owen, Jas. J. Brady.

Packard Motor Car Co.—H. B. Joy, C. J. Moore, W. L. Gleason, E. Roberts, S. D. Waldron, W. L. Conkling, E. Dobinson, C. G. Culver, E. H. Godshalk, Alvin T. Fuller, F. J. Pardee, Wm. Murray, F. I. Alliger.

Peerless Motor Car Co.—J. W. McClymonds, L. H. Kittredge, E. H. Parkhurst, C. Wridgway, E. W. Wridgway, J. A. Clark, Geo. T. Thompson, Harry Savage, J. L. Snow, Louis Sackett, F. M. Stettler.

Geo. N. Pierce Co.—Geo. N. Pierce, Chas. Clifton D. Ferguson, Henry May, Chas. Sheppy, Percy Pierce, Geo. Cooke, Edw. Rounds, Robert Patton, J. W. Maguire, H. Paulman, J. V. Lawrence, Marion Lambert, Garnett Zorn, Charles Joy, W. H. Ellis, F. A. Nickerson, E. C. Bull, F. S. Dey, W. J. Foss, Archie Hughes, D. A. Clark.

Pope Manufacturing Co.—Col. Albert A. Pope, Albert L. Pope, Col. Geo. Pope, Chas. E. Walker, Wilbur C. Walker, Harold L. Pope, F. C. Gilbert, D. H. Hinsman, J. F. Cox, Ned Lawrence, Fred L. Buckbee, F. M. Ridler, J. P. Fogarty, Edw. Dugan, W. H. Keller, A. E. Schaaf, F. M. Keeton, J. E. Hade, H. L. Haskell, R. V. Law, W. N. Taylor, H. G. Fisk, H. H. Rice, W. C. Johnson, H. A. Downing, Henry Goodman,

H. A. Leinhardt, Robert L. Winkley, J. W. Drown, Elliott Mason, R. E. Fulton, C. W. Spencer, R. M. Barwise, P. V. Clodio.

Royal Motor Car Co.—E. D. Shurmer, T. F. Newman, A. D. McLachlan, Robert Jardine, Geo. H. Bowler, Chas. A. Duerr, Geo. J. Dunham, Jos. McDuffee, G. Hilton Gantert, Maj. Francis H. Schoeffel, G. B. Demarest, W. G. Spencer, W. B. Murray, E. Shriver Reese, H. B. and W. Phinney, D. C. Pinney.

J. Stevens Arms & Tool Co.—I. G. Page, Frank Duryea, C. C. Hildebrand, A. W. Barber, Duffield Miles, Wm. Remington, Frank Eveland.

Smith & Mabley, Inc.—C. R. Mabley, A. D. Proctor Smith, Clair M. Hamilton, J. S. Bunting, Wm. P. Kennedy, Knight Neftel, W. A. Rue, H. Armour Smith, S. S. Thornton, F. E. Weir, J. V. Koch, Jr., Malcolm A. Strauss, A. J. M. Edwards, John Muller, Jr., Frank Dudgeon.

Studebaker Automobile Co.—Col. George M. Studebaker, T. W. Goodridge, A. M. Welch, H. Vanderbeek, Harry Fosdick, Jewell Dowling, W. R. Inness, Peter Dumont, R. T. Peckham.

F. B. Stearns Co.—F. B. Stearns, Roy F.

York, George F. Woolston, Jas. H. Crawford, Robert J. Walsh, A. S. Holden, P. J. Sterling, W. B. Robinson.

E. R. Thomas Motor Co.—E. R. Thomas Ezra E. Kirk, M. B. Hatch, H. J. Hass, George Salzman, Chas. S. Henshaw, R. D. Henshaw, C. A. Kingsley, A. H. Martin, C. A. Coey, F. H. Dart, Fred R. Harper, H. A. Meeks, C. K. Smith, John Harrington.

Vehicle Equipment Co.—Robert Lloyd, H. H. Havemeyer, Arthur Havemeyer, H. D. Lloyd, A. J. Doty, C. G. Rainier, R. W. Maginnis, J. R. Kinsey, Thos. E. Martin, R. H. Doughty, Raymond Havemeyer, Thomas Le Boutillier, A. Bogardus, P. C. Chrysler, C. P. Jeager, W. L. Brown.

Walter Automobile Co.—J. R. Vander-
veer, William Walter.

Waltham-Orient Mfg. Co.—Harrison Williams, L. B. Gaylor, E. P. Chalfant, W. H. Little, S. M. How.

Winton Motor Car Co.—Thos. Henderson, George H. Brown, Charles B. Shanks, Chas. W. Mears, Percy Owen, F. A. Hinchliffe, A. E. Maltby, C. W. Churchill, Harry Owsney, George Arbuckle, Chas. Calvert, J. A. Foster, J. Hervey Nichols, E. A. Godfrey, C. S. Wilcox.

Carey (Revolving Cylinder) Motors.—C. R. Bissell.

"C. G. V."—Julian Bloch, J. McAvoy, Jesse J. Beitler, Henri Leconte, J. Ullmann.

Panhard & Levassor.—A. Massenet, Ade Magnin, G. W. Post, Jr., Fred. Brevogel.

Detroit Auto Vehicle Co. (Crown).—H. W. Nicholds, Theo. Hinterman, E. B. Kennedy.

Dolson Automobile Co.—D. E. Dolson, W. H. Vinal, W. A. Schaum, John A. Seaverns, H. W. Doherty.

Dorris Motor Car Co.—G. P. Dorris, H. B. Krenning.

Duryea Power Co.—C. E. Duryea, R. C. Aldrich, Louis Lauther, Chas. Hunter, M. L. Rowe, G. T. Garside, H. De Hart, J. H. Fisher, E. L. Sturgis.

Henry J. Perkins Co. (Atlas Trucks).—H. A. Knox, A. L. McMurtry, A. B. Henley, F. W. Fowler, J. C. Cooper.

English Daimler Co.—E. Demar.

Frayer-Miller Motor Car Co.—F. E. Moskovics, Harry H. Knepper, Oscar Lear, Lee Frayer, Tom Roe.

Ford Motor Co.—Henry Ford, J. Cousins, L. C. Block, A. M. Robbins, Chas. E. Fay, Gaston Plantiff, L. E. Hoffman, L. H. Hall, E. R. Stearns, H. Howell, John S. Gray, John F. Dodge, H. H. Rackham.

Grout Bros. Automobile Co.—W. J. Gould, C. L. Gray, W. S. Saunders, W. F. Adams.

E. B. Gallaher (Brasier).—Harold T. Birnie, L. E. Tripler, R. H. Weaver, A. D. Chadbourne.

Hendee Mfg. Co.—G. W. Sherman, F. A. Baker, F. B. Widmayer, Amos Shirley, G. Piper, F. Conner.

Iroquois Iron Works (Auto Stage).—G. Middleton.

Iroquois Motor Car Co.—C. E. McGraw, John Leggett, H. M. Glen.

Johnson Auto Carriage Co.—Warren S. Johnson, J. C. Spaulding, B. H. Cuyler.

Johnson Service Co.—J. C. Spaulding, Prof. W. S. Johnson, D. H. Cuyler.

Jackson Automobile Co.—Ed. H. Barnum, L. C. Howard, S. R. Snook, Edward Diebel, Chas. W. Oathout.

The Lansden Co.—J. M. Lansden, Charles S. Schutter, Louis Ruprecht.

Lozier Motor Co.—C. A. Emise, F. C. Chandler, W. S. Mead, S. Reger, H. A. Lozier, Jr., E. R. Lozier.

Hotchkiss Archer & Co. (De Leon).—A. A. Archer, M. Canaux.

Lane Motor Vehicle Co.—George Lane, Samuel Lane, W. G. Richardson, Harold Wright, F. Schussler, H. C. Spratley.

Logan Construction Co.—B. A. Gramm, B. W. Twyman, Fred Bisantz, Carl Probst.

Maxwell-Briscoe Motor Co.—Benj. Briscoe, J. D. Maxwell, C. W. Kelsey, A. Grant, Colonel Pardee, A. Le Vino, C. G. Bleasdale, Mr. Morrison, Mr. Tyler.

Ardsley Motor Car Co.—F. R. Fuller, E. B. Blakeley, H. M. Wise.

Mors Automobile Co.—E. Lillie, A. L. Bennett, Edward Shotwell.

Names of Armory Show Attendants.

REPRESENTATIVES of automobile manufacturers were as numerous at the Armory as at the Garden, the number being about equally divided between the two shows. There were at the stands many whose names are closely identified with the industry, as the following list shows:

Acme Motor Car Co.—P. A. Fogarty, J. J. Delong, J. McCutcheon, I. Lengal, D. Webster, Arthur A. Devlin, Frank A. Devlin.

The Aerocar Co.—H. H. Thorpe, W. G. Morley, Alex. Y. Malcolmson, George S. Lisee, Mr. Pfahler.

Reo Motor Car Co.—R. C. Rueshaw, R. E. Ingersoll, Thos. Peter Cooper Forbes, D. S. Whitfield, C. F. Gilmour, R. E. Olds, R. M. Owen.

Austin Automobile Co.—Walter S. Austin, Frank A. Sanford.

American Locomotive Motor Cars.—Albert T. Otto, James Joyce, William M. Turner, W. G. Houck, Mr. Whitford, George B. Adams.

Aster Co.—A. Epstein, A. C. Thompson, Frederick Komp, Arthur Myers.

Central Park Auto Storage Co. (Spyker).—M. C. Overman, Lester G. Bruggeman.

Ariel Motor Car Co.—Ralph C. Lewis, C. Herbert Covell.

American Peugeot Automobile Co.—I. W. England, J. Dubois, Mr. Bannister Reynolds.

American Mercedes Co.—L. B. Smith, C. M. Bouggy, Frank S. Ray, Fred. Bremmer, "Ben" Benson.

Léon Bollée Agency of America.—H. L. Moody, Norris N. Mason, Fred. Spencer, Emile Bondy, F. O. Moody.

Berkshire and Bliss Automobiles.—F. V. Whyland, F. A. Knight, Douglas Andrews, Charles Tate, N. Van Sicklen.

The Bartholomew Co. (Glide).—J. B. Bartholomew, R. A. Whitney, G. G. Luthy, L. C. Wheeler, R. Holmes.

Marion Motor Car Co.—J. S. Conwell, R. H. Hassler.

Baker Motor Vehicle Co.—M. L. Goss, C. B. Rice, J. W. Harper, Harold Bostle.

Thos. B. Jeffery & Co.—G. W. Bennett, E. A. Gilmore, Walter Clapp, Jr., George H. Connor, C. A. Gilmore, George Cox, H. W. Shattuck.

Buckeye Mfg. Co. (Lambert).—J. W. Lambert, G. B. Lauderback, E. McLean, D. McLean, F. L. Hiller, E. E. Brode, A. R. Lambert.

Cleveland Motor Car Co.—W. L. Colt, L. B. Butler, R. H. Gallagher, F. E. Parker, A. R. Davis, A. B. Mamley, Arthur Garford.

Auto Car Equipment Co.—E. B. Olmsted, Wm. F. Dobert.

Cryder & Co. (Léon Bollée).—Henry C. Cryder, Paul Demy, Henri Didier.

Corbin Motor Vehicle Corporation.—J. S. Bretz, E. T. Kimball, B. F. Blaney, Lafayette Markle, Herbert Levick, Mr. Moore, Perkins, Bird, Perkins.

Chadwick Motor Car Co.—E. B. Jackson, Clarence Rowe, S. E. Oplinger.

Commercial Motor Car Co.—Arthur J. Slade, Wolcott Remington.

The Compound.—Geo. T. Schull, D. F. Graham, F. C. Carter, C. P. Hatch.

Crawford Auto Co.—R. S. Crawford, Chas. Morgan, Clifford Parks, Wm. Long, Jos. Troxell.

Moon Motor Car Co.—J. W. Moon, E. J. Moon.

Mitchell Motor Car Co.—C. P. Skinner, W. D. Brown, G. B. Rodgers, H. C. Williams, A. H. Sower, W. M. Jenkins, J. S. Griffith.

Dayton Motor Car Co. (Stoddard-Dayton).—Harry Croninger, C. G. Stoddard, J. H. Edwards, T. P. Rockett, James McIlvroid, James Larkin.

Mendel, Dale & Co. (Upton).—C. Upton, F. P. Upton, H. Mendel.

Moline Automobile Co.—E. W. Nicholson, Geo. Robertson, William Robertson, C. H. Van Dervoort.

Napier Motor Co. of America.—Walter H. Woods, Fred L. Woods, Wm. H. Hilliard, Henry Seymour, Otto B. Cole, P. T. French.

National Motor Vehicle Co.—A. C. Newby, George M. Dickson, W. G. Wall, Henry Hicks, C. H. Tyler.

Nordyke & Marmon Co. (Marmon).—H. C. Marmon, W. C. Marmon, H. H. Rice, R. J. Irvin, George Bott.

Premier Motor Mfg. Co.—H. O. Smith, R. I. Eads, S. H. Baker, W. A. Lutz, Alfred Comacho.

Palais de L'Automobile.—H. C. Neubauer, R. K. Haines, S. Suskind.

Pungs-Finch.—E. B. Finch, Mr. Porter.

Pittsburgh Motor Vehicle Co.—Chas A. Ward, Joseph Speidel

Palmer & Christie (Martini).—James Christie, A. T. Emery, Charles Palmer.

The Rainier Co.—J. T. Rainier, P. N. Lineberg, A. E. Morrison, A. E. Adams, E. A. Cordner, W. A. Lesser, A. N. Haines, H. U. Kibbe.

Rauch & Lang Carriage Co.—C. E. J. Lang, E. J. Lang, D. C. Cookingham.

Renault Freres Agency.—C. A. Tileston, M. G. Bernin, H. B. Miller, B. G. Wegman.

Rapid Motor Vehicle Co.—J. Baker, M. Hinckley, H. G. Hamilton, Max Grabowsky, A. G. North, C. M. Case.

St. Louis Motor Car Co.—Jesse French, Jr., T. B. Van Alstine, J. T. Rumble, J. Egan.

Viqueot Co.—Chas. Rainier, J. Caswell.

Westinghouse Companies.—Jules Neher, Mr. Heinrichs, Mr. O'Shea, E. S. Downs, Mr. Hubbard.

Welch Motor Car Co.—A. R. Welch, Fred Welch, H. M. Ambler, G. M. Dudley, A. E. Mills, G. H. Lighthall, L. H. Kent.

White Sewing Machine Co.—Carl Page, J. R. Parker, Harry Esselstyne, Harry Unwin, Max R. Greene, J. W. Ball, J. W. Warren, A. C. Keene, J. H. Parsons, Ray Darling, W. P. Frost, B. F. Adams.

Werner Car Improvements Co.—Oscar Werner, H. H. Cobe.

Windsor Automobile Co.—J. A. Windsor, Jr.

Wayne Automobile Co.—Roger J. Sullivan, Jesse Draper, A. L. Kull, J. H. McCarthy, George H. Lowe, George C. Lewis, W. M. Lewis, H. Wright, George A. Fisher.

York Motor Co. (Pullman).—James A. Kline, Robt. P. Morton, F. H. Kelley, A. P. Broomwell.

Züst Automobiles (Italy).—V. P. Pisani, E. B. Wilson.

A drop of oil on a bearing is worth more than a hundred drops spread over the outside of the machine.

News Notes of the Shows.

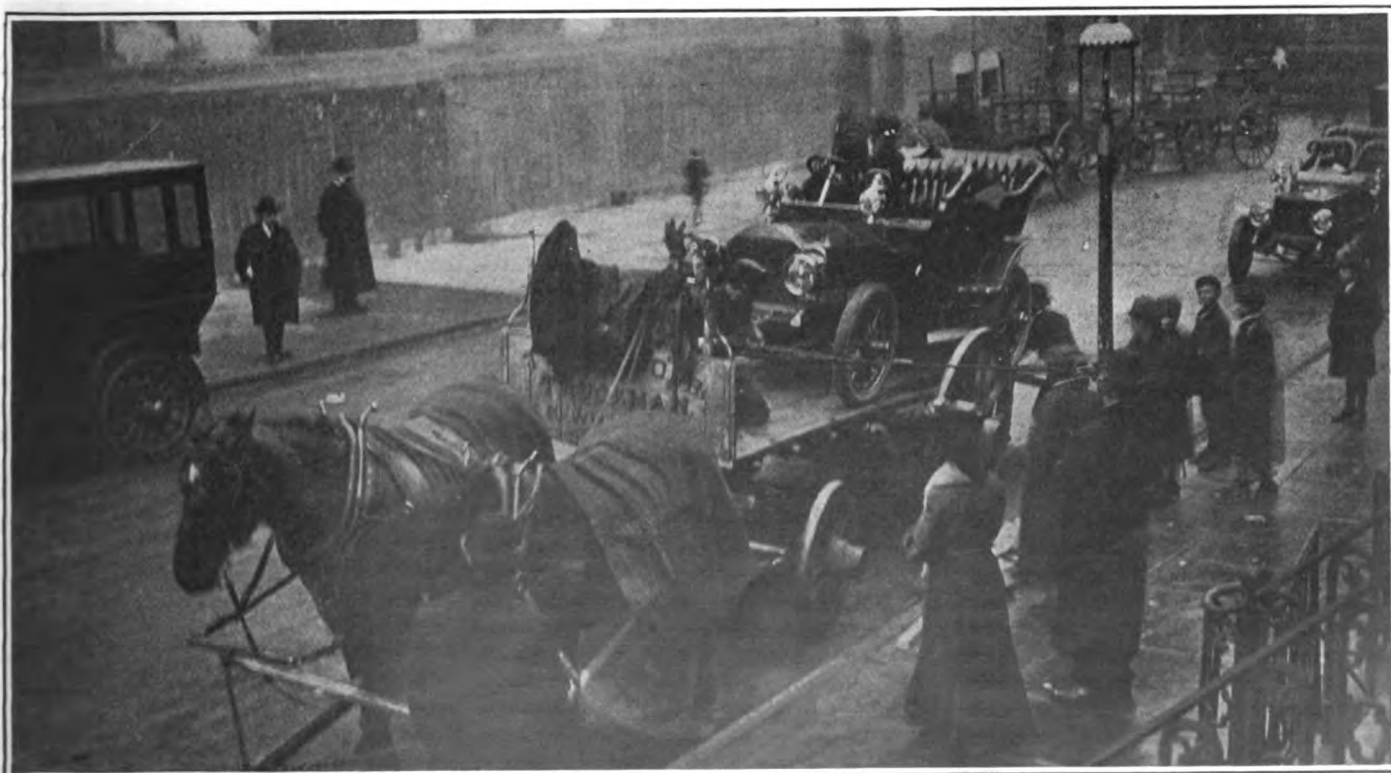
E. V. Hartford, president of the Hartford Suspension Company, who arrived from Europe on Thursday last, brought with him the signed contract which secured for him, for a term of years, the sole American selling agency for the Gobron-Brillié cars. A car of this make, it will be remembered, held the world's kilometer record for nearly two years after its makers abandoned speed contests. The Gobron-Brillié differs materially from other cars in having a four-cylinder motor with two pistons in each cylinder. The explosion occurs in the center of the cylinder, one piston moving up and the other down. The Gobron-Brillié patents have eight years to run. Mr. Hartford brought home a 35-horsepower touring car, which was used for demonstrating during the show.

* * *

It was officially stated on Thursday by the management of the Garden show that the foreign cars exhibited there (which are those imported under Selden license) represented makes constituting a little more than 82 per cent. of the total importation during 1905. This statement is based upon the Custom House records, which show the 947 gasoline cars entered the port of New York during the year. All but 200 of these cars were of the licensed makers.

* * *

One of the gossip subjects during the show week was the much-abused topic of trade papers. Many a promoter with a "long-felt want" up his sleeve was moved to furnish publicity projects which were



AN UNDIGNIFIED DEPARTURE—THE HORSE GETS HIS INNINGS AFTER THE AUTOMOBILE SHOW HAS CLOSED.

seemingly irresistible. The fever this year assumed the form of "specialized specialties" rather than general propositions, which seems to indicate that the established papers covering the industry are receiving proper recognition. But the specialized specialty ranging from a publication dealing with tires to one devoted to the long-suffering commercial vehicle presents the essence of specialized journalism. Next year at this rate we shall have offered separate journals for electric trucks, six-ton motor trucks, parcel delivery vans, and passenger vehicles, with a promising future for a carbureter publication and one devoted to cranks.

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The luncheons given by the Maxwell Briscoe Motor Company to visiting agents and guests at the Café Martin were largely



A MAXWELL RUNABOUT UP IN THE AIR.

attended and attracted much notice. The placing of a Maxwell runabout on a platform at a second-story window of the café caused the Fifth avenue pedestrians and the occupants of vehicles on that thoroughfare to stare in amazement.

An unfortunate who was trying to find out which was the "best automobile" wandered into a salesroom, where the manager forgot all about the magnificent qualities of his own machine in making a masterly and damning criticism of a competitor's car. The would-be purchaser made up his mind that a car that took so much knocking down must be a pretty good one, and promptly bought one. It proved to be a good car. Fact.

Meeting of the A. A. A.

There was a large attendance at the meeting of A. A. A. members in the rooms of the Automobile Club of America at the Armory on Wednesday afternoon. President Elliott C. Lee was in the chair. The principal address of the day was made by Winthrop E. Scarritt, former president of the association. In the course of his remarks he called attention of his hearers to two matters which he said were of vital interest to automobilists everywhere. These were the decreasing supply of gasoline and the growing tendency on the part of legislators to accomplish by indirection what they cannot legally do directly; that is, to drive automobilists off the highway by imposing upon them an onerous and burdensome tax, the claim being made that the automobile tire fittings wear out the highway.

"There are in use in America approximately 70,000 motor cars," said Mr. Scarritt. "These do not consume as much as the 800,000 gasoline stoves which are in use all over the Middle West, where fuel is always high. During the past five years the price of gasoline has doubled. The California and Texas oils are practically barren of gasoline distillates, and while the supply of gasoline is not growing, its consumption is rapidly increasing. What is our remedy for this threatening situation? It lies in the direction of vegetable alcohol. At present the United States Government taxes all alcohol \$2.00 per gallon. There is no reason why this tax should not be removed on denaturized alcohol; that is, alcohol rendered unfit for drinking. Experiments with this fuel made in France, and also in America, by Prof. Elihu Thompson, show that it may be used as a motor fuel successfully. Germany last year used over 70,000,000 gallons of denaturized vegetable alcohol.

"Its general use in this country would furnish a market for the farmer's surplus corn, apples, beets, potatoes, etc. A bushel of corn will make two and a half gallons of alcohol. The surplus of this year's crop over the average corn crop would produce 700,000,000 gallons of alcohol that could be sold at a profit at the present price of gasoline.

"A bill is soon to be introduced in Congress removing the tax on vegetable alcohol. This association, and automobilists everywhere, should unite with the public press in demanding the enactment of this most desirable measure."

Other addresses were made by Judge William H. Hotchkiss, president of the New York State Automobile Association; Sidney S. Gorham, president of the Illinois State Automobile Association; A. R. Pardington, ex-chairman of the A. A. A. Racing Board; Augustus Post, chairman of the Touring Committee; John P. Coughlin, president of the Worcester Automobile Club; Windsor T. White, of the Cleveland Automobile Club, and Emerson Brooks, who gave some

details concerning the proposed speedway at Pennington, N. J.

The meeting decided to have a technical committee of the association investigate and report upon means for alleviating the dust nuisance. The necessity of signboards was discussed, and the A. A. A. placed itself on record as discountenancing the use of searchlights in city and town except when absolutely required.

N. A. A. M. Annual Meeting.

The National Association of Automobile Manufacturers, Inc., held its sixth annual meeting on Wednesday afternoon at the Victoria Hotel. There were twenty-eight active members present. President Cutler's report showed that the affairs of the association are in excellent condition, and that the industry generally shows a marked advance over last year, with even better prospects for the future for those concerns which are conducted on sound business principles. The report of Treasurer Innis indicated a balance of more than \$30,000, as compared with a surplus last year of but \$10,000—this despite the fact that the association had contributed liberally during the year to road improvement and legislative funds.

All the retiring members of the Executive Committee, with one exception, were re-elected, E. R. Thomas succeeding Marcus I. Brock, whose retirement from active work in the trade rendered him ineligible. The hold-overs are Windsor T. White, W. R. Innis, A. L. Pope and C. C. Hildebrand.

The present officers were unanimously re-elected, as follows: E. H. Cutler, president; C. W. Bennett, first vice-president; A. L. Pope, second vice-president; S. D. Waldon, third vice-president; W. R. Innis, treasurer; Percy Owen, secretary, and S. A. Miles, general manager. The next meeting of the association will be held in the First Regiment Armory, Chicago, during the week of the automobile show there.

Dealers Deny Rumors.

Rumors were afloat throughout last week during the shows that the National Automobile Dealers' Association in annual session at the Victoria Hotel, contemplated seceding from the A. L. A. M. on the ground, in part, that the agreement to handle none but licensed cars worked a hardship to many of its members.

A dealer who handles a car made under the Selden patent is deprived of that agency should he accept the agency for a machine made by an unlicensed manufacturer, and this, so the story ran, was the crux of the proposed revolt.

President Smith, of the dealers' organization, assured a representative of THE AUTOMOBILE that no such action was contemplated. There were, he admitted, some few cases of individual dissatisfaction over the blacklisting agreement of the licensed

makers, but the large majority of the dealers was perfectly satisfied with present conditions in that respect.

President Smith and others of the officials denounced the treatment accorded them by the Garden show management in the matter of admissions, not alone for their employees, but for themselves. Many of these dealers had brought men with them—in many cases from distant cities—to familiarize them with the cars they are to handle during the coming season. But absolutely no arrangement had been made for the admission of these employees—even on a reduced-rate basis. Many of the dealers themselves, had to undergo the slow process of waiting for the raveling of a complicated red-tape system before they secured their credentials, unless they preferred to pay for their admissions—which many of them did.

SPEEDWAY TALK AT SHOWS.

A meeting of the promoters of the proposed Pennington, N. J., speedway, at the Armory on Thursday morning, took the form of a general discussion of the project preparatory to the inauguration of actual work. George W. Young, donor of the Corinthian cup to be contested for at Ormond, was announced as the latest convert to the scheme, in which racing men and manufacturers are beginning to take an interest. According to present plans, about five miles of the proposed course will parallel the Pennsylvania railroad, which would indicate the possibility in the not distant future of some exciting brushes between locomotives and automobiles.

A special speedway proposed, about which much has been heard during the week, was the National Automobile Speedway, which it is proposed to build near Barnegat, N. J. This track is to be thirty miles long, including a five-mile straightaway, all to be laid out on a tract of 6,000 acres. The plans include the building of a modern clubhouse and garage. Barnegat Bay, close by, will provide a natural auto-boat racing course. It is said that the \$300,000 necessary to carry this project to completion has been practically subscribed. The location of this speedway, near Lakewood, and within easy driving distance of New York and Philadelphia, will, it is believed, add to its popularity. Among the projectors are mentioned John W. Gates, John A. Drake and Charles C. Gates, of New York; G. Jason Waters, George P. Rogers and James Elverson, Jr., of Philadelphia; O. A. Turner, A. M. Bowling and William P. Whyte, Jr., of Baltimore, and Walter E. Edge, president of the Atlantic City Automobile Club.

Prospective Purchaser—"Why don't you fit make-and-break ignition to your cars?"

Brilliant Salesman—"Because, sir, everything about our car is absolutely unbreakable, including the ignition."

Canadian Route from Detroit to Niagara Falls.

DETROIT, MICH., Dec. 30.—Despite the fact that we are now lingering in the lap of winter, and snowdrifts are supposed to abound, there are many automobilists whose ardor will not be cooled and who still venture forth to explore new routes or traverse again those around which cluster pleasant memories of summer days.

A tour that has sprung into popularity among western automobilists during the fall and open winter is the journey from Detroit through Canada to Niagara Falls. The Canadian roads are generally good, and unless unusual weather conditions prevail, this trip does not offer the difficulties encountered on the muddy roads of the States. The bit of heavy pulling promised only serves to arouse the spirit of the autoist who wants to try out his car. The winter scenery along the route is well worth the journey, while the experiences along the way are always interesting.

The Canadians have invented a few terms of their own to apply to automobiles, and these appeal forcibly to the sense of humor when heard for the first time. President Edwin S. George, of the Automobile Club of Detroit, tells of one stop he made near London, where the usual crowd of ruralists gathered around to inspect and offer suggestions. One youth, desiring to impart information while he attended to his self-imposed duties of handing out monkey-wrenches and other tools as required, thus delivered himself:

"There's lots of billyin' by here now. My sister went a-billyin' last week with a feller, and she liked it lots. Dad says they are goin' to try to stop the gases goin' down this road. It scares the works [work horses]. Want me to go and get him to bring his works down here to see your billy?"

When a citizen of the United States crosses the Detroit river into Canada to make the journey to Niagara, it is first necessary for him to file a bond with the customs officer to insure the customs department against the selling of the car after it enters Canada. President George, of the Automobile Club of Detroit, is always glad to help the tourist over this "bump" of the trip, and he will quickly arrange matters when requested to do so.

The best route from Detroit to Niagara, which has been tried by President George and other members of the local club, is here given, stripped of useless verbiage so that it can be followed without difficulty.

After crossing the ferry at Detroit, the start is made on Glengarry avenue. Windsor, southeast, which follow for about eight miles. At cross roads, after crossing a six-foot bridge at corner of cross roads, turn left and follow road into Essex.

Leaving Essex, continue on Talbot road, following curves in road to end (grocery directly in front and blacksmith shop on the left). Turn left about 150 yards to first

road leading to right. Take this road and continue on it about 4 miles, crossing Michigan Central Railroad; about 40 rods further take first road to right and go straight ahead into Leamington, thence to Wheatley. Two miles beyond Wheatley turn right, go 3-4 mile, turn left (east) and follow road along the lake through Rooney, Dalton, Cedar Springs. Leave the lake here and continue on same road to Blenheim. Straight ahead over Main street, 1 mile from town turn left, pass cemetery and follow this road north 1-2 mile. Turn right just before crossing railroad track and follow road straight into Ridgetown—80 miles.

Continue straight ahead (east) 3 miles to end of road, turn left (north), cross two railroad tracks. At first road turn right (east) through Highgate, and at first road beyond Highgate turn left on the Muirkirk road to end of road; turn right (east) 1 mile, turn left, passing church on left, another mile to schoolhouse. Here turn right and continue about two miles to the town line road; turn left and follow road, crossing Thames river.

A the first road—the Longwood road—turn right and follow straight through the towns of Wardsville, Newberry, Glencoe, Kokomo, Lenberth to London—140 miles from Detroit. The last 60 miles is a direct drive over superb roads.

Leave London over Dundas street to Thanesford. Here the odometer should register 156 miles. Just before passing through Thanesford, cross stream, and at foot of hill turn right and follow road direct to Ingersoll. Enter this town at right angle to Main street. Turn right on Main street and go one block beyond Atlantic Hotel; turn left and follow road straight into main street of Woodstock—170 miles.

Continue east over Main street about four miles to forks. Hake right fork straight ahead through Cathcart, Burford and Mt. Vernon, crossing iron bridge over river to Main street of Brentford. Leaving Brentford, follow Colborn street east, along telephone line through Cainsville, Lanford, Alberton and Ancestor. Continue on same road (watch for bad curves) about seven miles, entering on King street into Hamilton—218 miles.

Follow King street 7 or 8 blocks, turn right 1 block to Main street, turn left and continue with curve to the right at a fork just out of Hamilton, then on to Stony Creek, Winona, Grimsby, Beansville and Jordon, which consists of a hotel and blacksmith shop. At the top of the hill in Jordon keep to the right direct into St. Catherines.

Leaving St. Catherines, go out St. Paul street to Queenstown street; follow this street through Homer to St. David. Here turn right at grocery and follow this road with its curves into the town of Niagara Falls. Go to the upper bridge to cross to the American side.

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Growth of Trade in Sundries.

A survey of the accessories exhibited at the shows provides a convincing proof of the magnitude to which an entirely dependent trade may grow. The *raison d'être* of the sundry business being the automobile, it is interesting to consider the development of this allied trade. In the first place, a great number of the concerns now engaged in the manufacture of such articles as are broadly classed under the head of sundries are by no means new in the world of trade, and a number have been long established as producers of standard articles of commerce. This is particularly true in the case of the manufacturers of tires and electrical goods, but here the broadening effect of the automobile is seen in the adaptation of the product to the new use and widening field.

For example, a few years ago it was scarcely possible to purchase in the open market an American made induction coil of anything but the crudest finish, with perhaps high efficiency, but not fitted for attachment to the well-finished automobile. This condition has been changed and there are now a number of concerns of the best standing making coils and other ignition specialties of the highest finish and efficiency.

The quality of tires has also been vastly improved and the output has increased to such a marked degree that the pioneers in

the business can no longer take care of the demand. This matter of demand has had much to do with the entry into the business of such a great number of manufacturers of accessories, the buying public requiring no great campaign of education and the dependency of the sundry business on the automobile industry being exemplified by the prosperity that marks the allied trade.

The total floor space occupied for the exhibition of sundries at the New York shows was nearly as great as that which was given over to complete vehicles, and of the total number of exhibitors more than one-half were the accessory and materials concerns. In a considerable number of instances sundries are entirely new articles rather than adaptations, though such things as tops, tires, batteries, coils and upholstery are logical developments and refinements of previous products of houses of long standing.

The horn, chime alarm, acetylene lamp, shock absorber and other small necessities have been devised solely to fit into the scheme of the automobile and, except in some crude and embryonic forms, would otherwise never have appeared, and certainly not in commercial quantities. The same thing may be said of such measuring instruments as the speed, distance and grade meter.

While the amount of capital directly invested in the business of manufacturing sundries is not so great as the total investment of the builders of cars, it is such a considerable sum that the stability of this branch of the industry is assured, while its growth is indicated by the great increase of interest on the part of visitors at the shows.

Prepaying Foreign Postage.

Concerns which have an established foreign trade know the importance of properly prepaying all matter sent by mail, including, of course, correspondence. Many foreign business houses refuse all underpaid mail matter with the result that the American correspondent suffers a loss of orders or creates a prejudice against his business methods. In most European countries the value of small things is very thoroughly appreciated, and houses of the first importance will take offense at matters involving expenditures on their part that an American house, under similar circumstances, would not bother about. In most, if not all, European countries the postal authorities impose a penalty of double the difference between the postage on an underpaid letter or package and the actual postage which should have been prepaid. In a house transacting an extensive foreign business the aggregate payments of penalty postage would foot up a considerable sum in a year.

The subject is discussed in a letter by U. S. Consul Creerey, of Glauchau, Germany, who says:

"It is particularly annoying to have to

pay penalty postage on business letters, letters asking favors, or advertising matter. That this is often the result of carelessness or stupidity of a mailing clerk is illustrated by two letters received at this consulate from a responsible American firm recently. One reads: 'We wrote you fully this morning, but regret that the letter should have been mailed by one of our clerks without proper postage.' The letter referred to was sent under a 2-cent stamp and cost 25 pfennigs (6 cents) penalty postage. The letter apologizing for the carelessness had no stamp and cost 65 pfennigs (16 cents). All letters for foreign countries should be carefully weighed and particular attention paid to the postage."

Many times the error is caused by failing to remember that while the minimum domestic rate for letters is two cents for *one* ounce, the lowest foreign rate is five cents for *one-half* ounce. The matter of postage is well worth the attention of firms trying to build up a foreign trade.



Correct Nomenclature Needed.

In the discussion of the automobile, either through the medium of the press or in everyday conversation, on the street or in the shop, the need of a correct and uniform nomenclature for the various parts and functions of the self-propelled vehicle becomes each day more apparent.

The use of the word "automobile" has been accepted so generally that any objection to its continuance can only be from the viewpoint of the etymologist. In great Britain the automobile is called a "motor-car"—not a bad name, but less pleasing to the ear and of no esthetic quality. Here at home we use the word "car" as a popular and short word, and specifically as meaning an automobile designed as a pleasure vehicle.

The need is not so much a name for the automobile as a correct and uniform designation of the component parts and accessories. The French language has furnished us with a number of terms which by reason of long continued use seem to admirably answer the purpose. The adoption of these French words is a logical outcome of the earlier period in the industry in America when the importation of cars formed a considerable proportion of the source of supply.

In a general way the rapid growth of the automobile industry in this country is responsible for confusion in nomenclature, the wide interest of the public in the subject provoking discussion not always along lines of conservatism and understanding. However, the introduction into our vocabulary of some dozen odd words of French origin need not be followed by their misuse. As an example, the word *mechanicien* might be noted. The Anglicized form, "mechanician," is used in the majority of cases incorrectly as synonymous with "mechanic." The automobile "mechanician" is rarely skilled in the

"theory and construction of machines," and the use of the word is misleading unless used with this understanding.

In the case of words which have long been a part of our own language a mistake is less excusable. For instance, "commutator" is commonly used, and by many competent men, to mean the make-and-break device upon which the correct timing of the motor depends. The function of this device is neither more nor less than that of a switch, mechanically actuated in such a manner that the switch is closed and opened at the correct moment when it is desired to cause combustion in the motor cylinder. Undoubtedly the intent is fairly plain when anyone speaks of the "commutator," but a commutator is a mechanism designed for altogether different purposes than the mere completion or interruption of an electrical circuit.

Indefiniteness marks the use of a number of terms, as, for instance, "steering wheel." At the very least this may mean any one of three wheels, and in the case of certain types any one of five wheels. "Radiator" is usually meant when "cooler" is used, and possesses a much more specific meaning. "Chassis" should be used in the same sense as the French understand the word, and since we have borrowed the term we should apply it to the same object, namely, the completed mechanism, frame, wheels, motor, change-speed and all the assembled parts of the automobile except the body.

What we need in the way of nomenclature is some recognized authority. A system once adopted would be easy of assimilation by the trade and the press, and its use by the public would follow, so that uniformity would soon be reached. The only possible solution of the problem is the action of some such body as the Society of Automobile Engineers, an organization eminently fitted to issue a complete nomenclature of the automobile, its parts and functions, and it is hoped that the members of that association will see fit to take early steps toward this end.

INDIANAPOLIS WANTS A COLISEUM.

INDIANAPOLIS, Jan. 20.—Automobile manufacturers, dealers and drivers of this city are lending their support to a movement to erect a coliseum in Indianapolis which will be large enough to accommodate an automobile show. The project is still in infancy. The growth of Indiana factories and their constantly increasing production are forcing Indiana to the front as a producer of autos, but, despite this fact and that Indiana is so centrally located, her manufacturers are compelled to go to other cities in order to display their cars in a satisfactory manner.

It is planned that the coliseum shall have a seating capacity of 15,000 persons, and it is expected that it will cost in the neighborhood of \$750,000. Of this amount it seems likely that a large portion of it will be raised by automobile interests.

Great Assemblage at A. C. A. Banquet.

SIX hundred members of the Automobile Club of America attended the club's annual dinner held at the Waldorf-Astoria, New York, on the evening of Saturday, January 20, the last day of the most successful automobile show ever promoted by the club. The great ballroom was magnificently decorated with flowers, ferns, palms and evergreens, the pillars and most of the walls being hidden by masses of color and foliage; on the tables were stands of American Beauty roses and decorations of Southern smilax. The galleries of the ballroom were filled with ladies, friends of club members and those who had been unable to secure seats at the tables; the handsomely gowned ladies and the beautiful floral decorations of the gallery fronts added greatly to the brilliancy of the scene. The guests at the A. C. A. dinners are always presented with a souvenir or memento of the occasion; this time a seal cardcase was given to each member, with the recipient's name stamped in gold letters; in the case was a little card bearing the menu, which was as follows:

MENU



Buffet Russe

Oranges de Floride avec
Rocher Frères Orange Curaçao

Tortue Verte claire

Radis Pim-olas Céleri vert
Amandes salées
Noix marinées

Coquilles de Flétan

Couronne de Ris de Veau
aux champignons frais

Filet d'Agneau, Sauce Tyrolenne
Petits pois sautés
Piments verts farcis

Sorbet de Fantaisie

Terrapène à la Philadelphie

Canard Canvasback Rôti
Hominy frit Gelée de groseilles

Salade de fruits

Glaces Assorties

Petits fours Noix et Raisins

Café

Conocedor Amontillado Sherry
G. H. Mumm & Co.'s Selected Brut
Ayala Magnet, Extra Dry
Apollinaris
Dewar's White Label Scotch
Dawson's Old Curio Scotch
1824 Brandy, A. C. Meukow & Co.
Cordials
Cigars (Waldorf-Astoria Cigar Co.)
Pall Mall Cigarettes

Another pretty feature of the dinner was that the ices were served in *papier maché* automobiles, searchlights, airships, and other mechanical forms—the airships being especially appropriate in view of the presence of members of the affiliated Aero Club of America.

The president of the A. C. A., Dave Henzen Morris, was toastmaster. On his right sat Prof. Alexander Graham Bell and on his

left John Jacob Astor. The other guests at the president's table were Henry M. Duncan, Jefferson Seligman, Henry C. Rouse, Colgate Hoyt, Milton J. Budlong, Samuel H. Valentine, Henry D. Estabrook, William H. McElroy, Gen. George Moore Smith, Winthrop E. Scarritt and John Brisben Walker.

President Morris, as toastmaster, referred in his opening remarks to the interest taken by foreign government officials in road racing and expressed the opinion that the same course might be followed in this country with advantage to the automobile movement. Professor Bell, speaking on behalf of the airship movement, referred at some length to the problem of aerial navigation, stating that he believed the airship would be rapidly developed on both sides of the Atlantic simultaneously. Professor Bell believes that the solution of the problem will take the form of an aeroplane propelled by a light but powerful motor.

The speeches which followed were, for the most part, disappointing to those who expected to hear interesting and valuable discussions on matters of interest in connection with automobilism, and were more in the nature of after-dinner inanities than serious utterances intended to be of permanent interest.

Among those present at the dinner were the following:

David W. Abercrombie, Dr. C. T. Adams, C. C. Adams, Albens T. Adams, George B. Adams, C. L. Addison, Louis R. Alberger, A. H. Alker, Capt. F. M. Alger, Russell A. Alger, Jr., J. D. Anderson, Maj. James M. Andrews, James S. Anthony, Frank C. Armstrong, Theodore P. Artaud, Albert Ashforth, J. W. Aylesworth.

Don H. Bacon, Louis P. Bach, S. H. Baer, A. C. Banta, Julian H. Barclay, A. L. Barber, A. Victor Barnes, William Barbour, E. E. Bartlett, C. W. Barron, Dana P. Bartlett, Charles D. Barney, Col. Allan C. Bakewell, J. W. Ball, Frank H. Ball, William N. Beach, W. G. Bee, E. M. Belding, M. M. Belding, Jr., W. S. Belding, A. J. Belden, Frank Bell, Charles J. Betsig, Cortlandt F. Bishop, Gustav Blessing, Ph.D., E. T. Birdsall, George M. Bingham, Luther L. Blake, K. M. Blake, Bron, Samuel Brill, W. G. Brooks, J. F. Booth, Charlton P. Brooke, Emerson Brooks, Phillip J. Britt, Curtis P. Brady, G. J. Bradley, James C. Brady, Daniel M. Brady, H. H. Brady, Jr., Herbert P. Brown, Grant Hugh Brown, Samuel Brill, W. G. Brooks, J. F. Brice, George T. Brokaw, Nicholas F. Brady, James Brown, Stephen H. Brown, John T. Brush, Benjamin Briscoe, William H. Brown, George P. Butler, William H. Butler, Winslow E. Busby, Dr. J. A. Bullard, William W. Burke, J. S. Bunting, L. B. Butler, S. M. Butler.

John A. Caldwell, Hon. John F. Carroll, Herbert S. Carpenter, Eugene J. Cantin, John Calder, W. M. Campbell, Jess Cassard, Louis Cassier, J. Hayes Carstairs, Charles Carstairs, George F. Chamberlin, A. H. Chadbourne, W. E. Chipman, Frank Chipman, A. W. Church, K. O. Chisholm, Alfred N. Chandler, H. Durant Cheever, John Clark, George Clarke, Dr. G. D. Cochran, Kenyon B. Conger, W. E. Corey, W. L. Colt, George M. Cohen, E. J. Corbett, M. R. Connell,

Maurice Coster, Norman P. Cooley, David Crutchfield, Henry C. Cryder, Dr. D. Le Roy Culver.

George H. Day, W. W. Darley, C. L. Dane, Edward T. Davis, S. T. Davis, Jr., Dr. F. M. Dearborn, L. C. Dessar, J. E. DeMar, W. D. Denegre, J. W. de Aguiro, L. C. de Coppet, A. de Magnin, J. Henry Dick, J. H. Dickinson, Philip T. Dodge, Perry H. Dow, H. F. Donaldson, Dr. L. F. Donohue, M. V. Doud, Burton Dowling, Frederic S. Doremus, F. E. Drake, Capt. F. R. Drake, C. A. Duerr, Thomas C. Dunham, Col. P. S. Dyer, Richard N. Dyer, Jos. Dykes.

A. W. Eager, Hayden Eames, Henry Edmunds, William C. L. Eglin, Alfred Ely, William D. Ellis, John Elliot, James Elverson, Jr., L. W. England, A. L. Erlanger, Charles E. Etheridge, Mark S. Eustace, Frank Eveland, H. J. Everall.

Ernesto G. Fabbri, E. A. Fairchild, James F. Fargo, C. E. Farnsworth, George H. Fearons, Murray W. Ferris, E. H. Fitch, Ezra H. Fitch, Ernest Flagg, William M. Fleitmann, Frederick T. Fleitmann, George H. Flinn, F. S. Flower, N. M. Flower, Peter Fogarty, Eugene A. Fornes, Julius K. French, Arthur Frowein, Mortimer B. Fuller.

Frank S. Gannon, David H. Gaines, T. J. Gaines, Jr., E. B. Gallaher, R. D. Garden, Andrew L. Gardiner, A. L. Garford, Francis P. Garvan, William D. Gash, Charles G. Gates, John W. Gates, Harry George, C. H. Gillette, W. E. Gilmore, Henry Ginnel, W. S. Ginnel, J. W. Gilson, Frederick Glassup, Frederick Glassup (guest), W. C. Gotshall, C. A. Godshalk, H. A. Grant, Edward Graves, Olin D. Gray, Andrew Gray, Max R. Greene, Warwick Greene, V. R. Greene, R. A. Greene, T. L. Greenough, W. A. Griffith, V. M. Gunderson.

Clarence M. Hamilton, J. T. Harwood, John Hall, P. C. Hale, William Hawley, Alan R. Hawley, J. F. Hart, J. Horace Harding, Charles E. Hadley, John F. Havemeyer, J. G. Haeslett, James M. Hartshorne, George F. Harriman, Howard S. Hart, Maxwell S. Hart, C. A. Hanna, Frank Hedley, Capt. Homer W. Hedge, E. H. Heinrichs, A. P. Heinze, E. J. Heppenheimer, Gen. W. C. Heppenheimer, A. P. Hexamer, G. F. Heublein, A. B. Henley, W. C. Heydecker, W. S. Hilles, W. A. Holton, George C. Hollister, E. Rand Hollander, L. J. Holton, James Hopkins, A. C. Hottenroth, Frederick W. Hottenroth, Walter B. Horn, Walter L. Horn, A. H. Hopping, Gen. G. E. P. Howard, David Huyler, Archer M. Huntington, Archer M. Huntington (guest), W. B. Hurlburt, George B. Hutton, Richard Irwin, Felix Isman.

Robert Jardine, Charles M. Jarvis, H. L. Jones, M. B. Johnson, Walter Howard Johnson, Ormond Lawson Johnston, Henry B. Joy.

G. Kauffman, W. W. Kelchner, Hon. James E. Kerr, Henry W. Kent, Richard Kennerdell, R. C. Kelsey, William P. Kennedy, George K. Kirkham, C. W. King, J. A. Kingman, Charles King, C. E. Knoblauch, F. M. Knowles, C. J. Knowles, J. G. Kugelman, Robert S. Kunkel.

E. J. Lake, John M. Lansden, Jr., William W. Lawrence, George Landers, George Landers (guest), Arthur B. Leach, G. Howland Leavitt, John J. Ledwith, Ralph C. Lewis, J. M. Leopold, George A. Legg, Frederick G. Lee, M. Le Vio, Warner M. Leeds, F. M. Lockwood, L. F. Loree, C. M. Lowther, Geo. Lowther, Harry J. Luce, Whitney Lyon.

James H. MacDonald, W. H. Malley, Winslow Mallory, Frederick Marsh, W. N. Mason, John Markle, Charles M. Manly, J. J. Mandery, Carleton Macy, Melville D. Martin, A. Massenet, V. L. Mason, J. D. Maxwell, George Ross Mackenzie, H. R. Mackenzie, A. D. MacLachlin, Rufus L. MacDuffie, J. H. MacAlman, Patrick H. MacCarren, James J. McGuire, Joseph B. McCall, Ira A. McCormack, P. H. McMillan, Henry B. McQueen, George E. McQuesten, Herman A. Metz, Rich-

ard W. Meade, Henry Mehl, Walter H. Merrill, F. A. Merrill, A. E. Merrill, Leonce Messines, Cord Meyer, W. B. Miller, A. E. Miller, Charles E. Miller, John Miller, S. A. Mitchell, A. H. Morris, Robert Lee Morrell, J. Howard Morse, I. J. Morse, H. F. Mollenhauer, Frederick P. Morris, W. J. P. Moore, Louis P. Mooers, R. S. Munger, R. C. Munger, Dr. John P. Munn, Thomas J. Murphy, William A. Murphy.

Robert Naegell, Edward C. Newcomb, Hon. T. H. Newberry, J. Neher, W. W. Niles, William P. Norton.

William W. Ogden, Dudley Olcott, John F. O'Rourke, James H. Otley, A. H. Overman, W. C. Overman.

Orrel A. Parker, R. G. Packard, Jr., J. W. Packard, Carl Henry Page, William H. Page, Jr., E. S. Partridge, K. C. Pardee, Andrew Peters, John Pierce, Karl D. Perkins, H. B. Phinny, W. P. Phinny, W. T. Plimpton, Charles S. Phillips, N. Taylor Phillips, Percy Pierce, Conrad N. Pitcher, John F. Plummer, Jr., Augustus Post, H. T. Pond, J. M. Porter, H. W. Pratt.

Hon. Lemuel E. Quigg.

H. E. Randolph, James E. Ratchford, William Remick, Rev. Alban Richey, Isaac L. Rice, John Rice, Howard Riegle, Benjamin Riegle, A. L. Riker, W. J. Riker, J. T. Roche, Jr., A. W. Robinson, E. H. Rosenstock, Pierre Lorillard Ronalds, H. P. Robbins, Basil W. Rowe, M. J. Rothschild, J. E. Roosevelt, J. B. Russell, E. F. Russell.

William D. Sargent, Henry Sanderson, Robert P. Scott, George I. Scott, William P. Scott, Jr., Myron Schafer, George E. Schank, Charles F. Schutter, John Schlosser, Philip Schlosser, D. E. Seybel, A. D. Seymour, E. D. Shurmer, John Shepard, Jr., W. L. Shearer, Jr., Royal R. Sheldon, A. R. Shattuck, William C. Shanley, J. M. Shaw, Hon. Theodore H. Silkman, Angus Sinclair, George Singer, Arthur J. Singer, Jerome Siegel, R. W. Slusser, George J. Smith, E. E. Smathers, Charles G. Smith, R. H. Smith, Arthur T. Smith, Eugene Sondheim, Charles S. Somerville, Charles E. Spratt, George B. Spearin, I. N. Spiegelberg, J. G. Stuart, J. M. Stoddard, Albert J. Stocker, T. W. Stemmler, Benjamin Stern, Frederick C. Stevens, Richard Stevens, S. B. Stevens, Ed. J. Steiner, H. S. Sternberger, Alix W. Stanley, Herbert Strong, J. S. Sturgis, F. C. Sutro, H. R. Sutphen, H. M. Sweetland, George E. Sykes.

Albert Taylor, Samuel Walter Taylor, B. L. Taylor, H. R. Taylor, Gage E. Tarbell, Edward A. Taft, George P. Tangemann, C. C. Tegethoff, W. C. Temple, William S. Teel, Jr., General Thayer, William Thaw, William Thaw (guest), Thomas H. Thomas, T. E. Tomlinson, J. de Mont Thompson.

Hermann Unger.

Hon. Robert A. Van Wyck, D. L. Van Nostrand, Philip Van Volkenburgh, William Van Anden, B. C. Van Dyke, F. I. Vander Beek, M. J. Verdery, Atwood Violet, Rev. Wm. H. Vibbert, H. H. Vreeland.

S. D. Waldron, R. H. Wallace, Walter T. Wallace, W. R. Warren, Dr. W. S. Washington, G. Jason Waters, Francis A. Watson, H. R. C. Watson, R. H. Weaver, Gustav Weinberg, J. J. Welch, C. W. Wells, Henry F. Wells, Edward Weston, Edward F. Weston, C. F. Wetsel, J. G. White, Dr. Schuyler Skatts Wheeler, A. G. Wheeler, H. C. Whitman, Clarence Whitman, A. H. Whiting, W. McC. White, R. D. Willard, John A. Willson, Winslow Tracy Williams, Frank L. Wing, Arnold Wood, A. D. Wood, O. J. Woodward, Hon. R. S. Woodruff, E. B. Wright, C. F. Wyckoff.

C. S. Yeagle.

Clean glass in a lamp makes far more difference in the strength of the light projected than most people suppose.

ROADS EXPERIMENTING.

Alton and Burlington Trying Motor Cars While Illinois Central Looks on.

CHICAGO, Jan. 22.—Several of the railroads which have suburban service in and about Chicago have become deeply interested in the subject of gasoline motor passenger cars, and two or three have been experimenting of late along this line. The Chicago & Alton tried out a car which gave satisfactory results at first, but which did not meet with every requirement after the first trial. The company has not lost its confidence, however, and believes that railroad cars driven by gasoline engines have a bright future in suburban service, which requires high speed for short distances and quick stopping and starting.

The Chicago, Burlington & Quincy railroad is also experimenting with gasoline motors in its shops, and is endeavoring to secure a quick-starting, heavy traction car. The Illinois Central has also become interested and is watching the efforts of its rivals with a view of doing something in the same line itself, if the cars prove successful.

One feature of gasoline cars which appeals to the railroad men is the fact that the danger which is always present when an overhead trolley or third rail is used, is eliminated.

A MOTOR CAR RAILROAD.

BALTIMORE, Md., Jan. 22.—An application will be made to the present General Assembly of Maryland for a charter to operate an automobile car line between Chestertown, Kent county, Md., and Tolchester Beach, the enterprise being projected, it is said, by George R. Snoddeal, of Baltimore, and several New York capitalists. It is proposed to obtain rights of way over private property, a number of such rights having already been granted.

Gasoline propelled cars, seating thirty persons, will be used on ordinary railroad tracks of sixty-pound rails. Each car will have 100 horsepower, and it is expected that a speed of thirty miles an hour will be obtained. This would reduce the time required to cover the eleven miles between the two points to a fraction over twenty minutes. At present it is nearly a two hours' drive by horse.

It is said that if the line is built it will eventually extend to other points in the northern part of the county. Kent county residents have expressed their gratification and enthusiasm over the scheme.

A pocket electric lamp is an exceedingly convenient thing to have about the car.

If the nuts on the bolts in your car are not fitted with spring washers, jam nuts, cotter-pins or some other retaining device, you will be wise to make sure that every nut will "stay put" by applying something of the sort without delay.

Stanley Steamer Goes Mile in 31 4-5 Seconds.

THE first races on the Florida beach were held on Tuesday, January 23, having been postponed from the previous day, and in the one-mile steam championship the mile record was broken by the winner, the Stanley steam car driven by Marriott, the time being 31 4-5 seconds.

The initial morning dawned with plenty of fog, rain and wind; but the weather improved somewhat as the day grew older, and by 11 o'clock had moderated sufficiently to

conditions, and the 90-horsepower Napier is credited with an unofficial mile in 31 seconds.

The entry list for the amateur race at 10 miles was re-opened, owing to the fact that but two entries had been received. Several new entries have been received and a good contest seems probable. The trophy offered for this race by George W. Young here illustrated is a handsome piece of art work. The Young trophy was on exhibition at the automobile show in the Armory, New York, and attracted a great deal of attention and admiration. Another beautiful trophy is the silver cup offered by the A. C. of Minneapolis, the prize for the 100-mile race. The cup, including its ebony base, stands more than three feet high and is surmounted by an American eagle with outspread wings; the value is \$3,000.

The races will be timed by the McMurtry electric timing apparatus, in charge of A. L. McMurtry. The other timers will be S. M. Butler, J. W. Kerrison and Walter C. Baker.



CORINTHIAN TROPHY FOR TEN MILE RACE
DONATED BY GEORGE W. YOUNG.

permit a start to be made. Great enthusiasm was displayed by the visitors, who were at the beach, notwithstanding the adverse conditions. The telegraph wires leading out of Daytona were not in working order until about noon.

The Thomas six-cylinder racing car will not be sent to the beach, and the machine is now stored at the New York garage of the Thomas company.

Immediately after the New York shows closed—and in many cases before the shows closed—people began the journey to the Florida beach. Hundreds went from New York alone, many by special trains. Guests at the dinner of the Automobile Club of America made a hasty exit after the speech-making and caught a late train for the great speedway. The people at the beach are kept on the keen edge of expectancy by the possibility—some believe the probability—of speeds equal to two miles a minute, and with plenty of fast cars, a beach in fine condition for fifteen miles and good weather the best of sport is looked for during the meet.

In practice spins the cars have shown great speed; the Stanley steam car is said to have covered a kilometer in 19 1-5 sec-

The Minneapolis Cup.

The cup that the Minneapolis Automobile Club has offered for competition at Ormond will be known as the "Minneapolis Automobile Club Speed Trophy." With the base, which is of black ebony, it stands more than three feet high, and is valued at \$3,000. On the top is an American eagle with outspread wings, while immediately below on either handle are two automobile wheels, each bearing a pair of wings. On the front side, contrasting pleasingly with the sterling silver of which the cup is made, is the club monogram emblem, "The Automobile Club of Minneapolis," in gold. Supporting the trophy are several draped figures bearing victors' wreaths, and ornamenting the base are three miniature reproductions of speeding automobiles.

The cup will be raced for in a 100-mile, straightaway event, with flying start. The trophy was carried to the tournament in the special train that the club has chartered for the Daytona trip.

Asa Paine, a prominent automobile enthusiast of Minneapolis, was recently elected president of the Florida East Coast Automobile Association, and it was in recognition of this honor to the city that the Minneapolis club decided to donate the trophy.

The rules governing competition for the cup specify that it shall be raced for at least once each year until won twice by the same party under the rules of the A. A. A., or other racing organizations given proper sanction; that the contest shall be open to all cars of weights within the heavyweight international classification of 2,204 pounds, regardless of power or country of manufacture; that the trustees shall have the right to reject any entry, to decide all matters not specifically covered by the

conditions, and to change the conditions with the consent of the donor.

The board of trustees consists of the president of the A. A. A., the president of the Chicago Automobile Club, the president of the Minneapolis Automobile Club, H. L. Bowden, of Massachusetts, W. J. Morgan, of New York, C. F. Haglin, of Minneapolis, Horace Lowry, of Minneapolis, C. G. Burgoyne, Asa Paine and S. H. Gove, of Daytona, Florida.

ITINERARY OF MINNEAPOLIS SPECIAL.

MINNEAPOLIS, Jan. 22.—The itinerary of the special train of the Minneapolis Automobile Club was finally arranged last week, and affords one of the most attractive trips ever made from the Twin Cities. The party left Minneapolis on Saturday evening at 8 o'clock for Chicago, where the car was transferred to the Big Four railroad, which got them into Cincinnati at 6 o'clock Sunday evening. From Cincinnati they went over the Queen and Crescent, and should have reached Chattanooga this morning at 7 o'clock, to remain until 3 P. M. Special



MINNEAPOLIS AUTOMOBILE CLUB SPEED
TROPHY FOR 100-MILE RACE AT
ORMOND, IN FLORIDA.

cars were engaged to carry them to the top of Lookout Mountain, where they were to have dinner at the Lookout Inn.

Leaving Chattanooga in the afternoon they will go to Atlanta and then to Jacksonville, arriving at 8.30 o'clock Tuesday morning. A stop was to be made at St. Augustine so

that they could visit the old cathedral, Fort Marion, the famous sea wall, the Casino, the Alcazar, and the Ponce de Leon. At Daytona the train will be sidetracked until Saturday evening, when the return trip will be commenced.

ORGANIZE TO BUILD.

TOLEDO, O., Jan. 20.—The Commercial Motor Truck Company, which succeeds the American Motor Truck Company of this city, has made arrangements whereby it is to locate permanently in Plymouth, Ohio. A factory, 60 by 100 feet, is being erected, which is to be ready for occupancy by April 1.

The new company is capitalized for \$50,000, and the manufacture of automobile trucks is to be conducted on a fairly large scale. It is the plan of the company to increase its plant as required. It now has orders for a number of vehicles, and pending the completion of its plant in Plymouth these will be built in Toledo.

The truck which the company will make has a gasoline engine. For the present but two styles will be made, of two and five tons capacity, but at an early date the company hopes to be in a position to execute orders for trucks of various styles. Numerous satisfactory tests have been given the truck in Toledo.

Charles A. Keller, a local attorney, is president of the company although a new roster of officers is to be elected this month. A number of other Toledo men are financially interested as well as a number of residents of Plymouth.

Notwithstanding the fact that electricity is as vital to the operation of a gasoline motor, as is gasoline itself, many an automobilist knows comparatively little about electricity or of the principles which underlie his ignition apparatus. With a view to supplying the requisite information in a convenient and easily digested form, T. H. Hawley, author of "Motors in Principle and Practice" and other works of a similar character has written a volume on "Motor Ignition Appliances." In this book the author plunges directly into the practical matter in hand without burrowing into unnecessary theory, and explains what must be understood in order to gain a clear comprehension of the working of various types of ignition apparatus. Then the reader is given clear explanations of the constituent parts of the ignition systems in use and is told what they do, why they do it and how to set them going if they stop how to find troubles and how to remedy them when found. The book contains 137 pages and is illustrated by numerous line engravings and half-tones, showing the constructional details of spark plugs, coils, vibrators, magnetos and so on. It is published by the Cycle Trade Publishing Co., of 21 Wilson street, Finsbury, London, E. C., England.

Diversions of Houston, Texas, Automobilists.

By O. O. BALLARD.

HOUSTON, TEX., Jan. 20.—Automobilizing for recreation and pleasure is actively pursued in the Texas coast country eight months in the year. Late winter and early spring constitute the dull season, the heavy rains then making the prairies marshy and the dirt roads heavy and difficult to travel, although they are excellent at other times.

By the middle of spring the Houston Automobile Club enters upon a season of activity. The majority of its sixty members are enthusiasts and take part in the many club events. An inclination is shown for unique affairs, such as racoon and opossum hunts by night; "jack rabbit" runs across the prairie, oyster roasts at remote and picturesque spots, and fishing outings along Galveston Bay. Wives, daughters and women friends always participate, and from twenty to forty machines filled with merry parties usually line up for each trip.

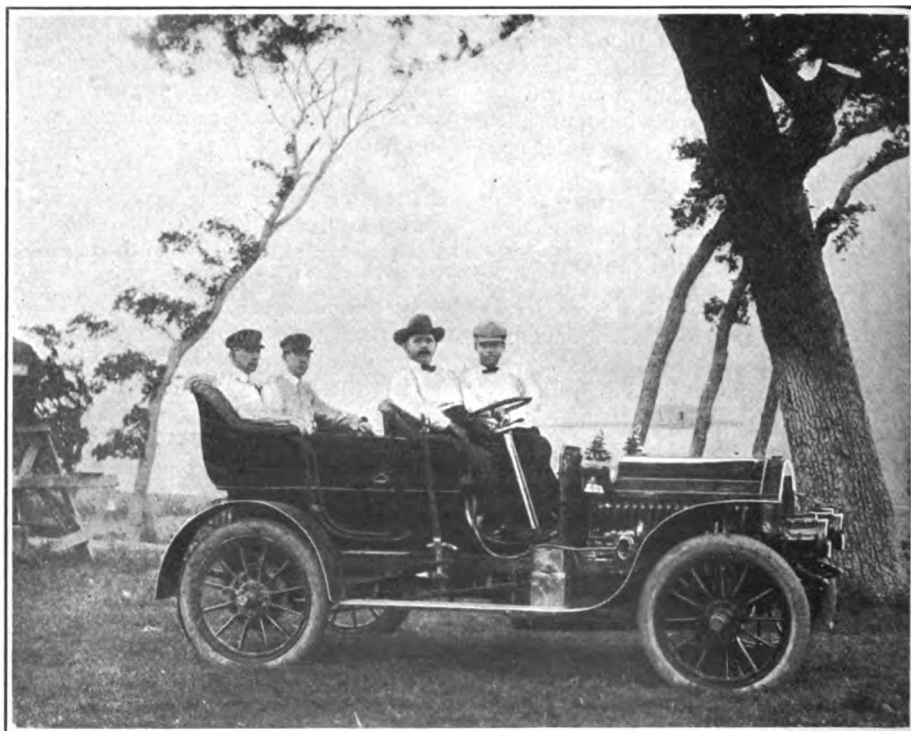
'Coon and 'possum hunts were very popular last season, when they were conducted in the vicinity of the Bering rice plantation. There is a fine old country house there, and it is always open to the automobile guests. A pack of hounds skilled in hunting nocturnal game is also kept at the plantation, and is at the disposal of the parties. Messrs. C. L. and Theodore Bering and Miss Jennie Bering are in the semi-roll of hosts and hostesses when the plantation house is made the rendezvous point on an evening's spin. Miss Bering is secretary of the club. A fine wood skirts the meanderings of Buffalo bayou, and passes very near the house.

If a 'coon and 'possum hunt has been prearranged, provisions for a luncheon or a feast are taken along by a party to the ranch house. The refreshments usually are of a substantial character, for the diversion of an hour or so in the woods after game is certain to stimulate an appetite.

The automobiles are left at the house and the party follow afoot the yelping hounds, which are turned loose, and enter the woods. For the double purpose of more easily penetrating the darkness, and for "shining" the eyes of the game, two or three members of the party carry headlights deatched from the automobiles. The bright rays are splendidly adapted for fire hunting.

There is very little real hunting done, although the sport is greatly enjoyed. The hounds enter into it with as much vigor as though skilled sportsmen were backing their movements. It usually requires but little time to tree a 'coon or 'possum, and the party gathers in a circle about the tree while some of the athletic young men undertake the task of shaking the game from its hiding-place among the limbs. A pair of pole climbers are always taken along, and with these strapped to the feet it is not difficult to get into the upper limbs and dislodge the animal. The dogs do the rest. There is always some game bagged, and on one of the last runs a raccoon was captured alive, but shortly after was given its freedom again.

The jack rabbit hunts are also conducted at night, and are best when there is no moon. The runs are made over the prairie.



HOUSTON AUTOMOBILISTS ON THE SHORE OF GALVESTON BAY.



DRIVING ON THE SHELL ROAD NEAR HOUSTON, TEXAS.

and the headlights and the exhausts of the machines do very effective work in routing out the game. The rabbits seem fascinated by the lights and behave most queerly, following them or running toward them instead of away.

Fishing excursions to the points along the bay take up a day's time. Morgan's Point, one of the favorite places, is reached by a twenty-five-mile run, twenty miles of which is over a fine shell pike as smooth as an asphalt pavement. These trips are most popular with a number of members of the club, who enjoy them at the end of each week during the fishing season. There are several road houses along the way at which good dinners and refreshments are to be had.

The headwaters of Brays bayou, fifteen miles from Houston, is frequently selected for oyster roasts or basket spreads in the evening. The spot is particularly picturesque by moonlight, and the Poor Farm pike leading to it is inviting for speed. If the outing is at night, huge bonfires are built, and the howling of wolves in the distance lend weird music. The oyster roasts are sometimes on an elaborate scale, and entertainment in the way of string music is provided.

Long distance runs have not been popular owing to bad roads. The Poor Farm road, fifteen miles; the Harrisburg shell pike, twenty miles; the Clark street gravel road, twenty miles, and the Main street shell and gravel pike, ten miles, constitute the principal paved highways. The dirt roads prove almost as popular during the season, and much longer runs on them can be taken.

Some of the hardier members of the club have made long-distance trips. Messrs. C. L. and Sam Bering and Captain C. E. Hays made a trip of 250 miles down the coast to Port Lavaca last summer in an Olds. The entire distance is as flat as a floor, but the trip became very irksome owing to un-

bridged streams and the boggy nature of the prairie roads in places. Runs have been made to San Antonio, 220 miles, but they were trying. Houston to Galveston, fifty-five miles, is a rather inviting trip, and is frequently made both ways in a day, with a few hours to spend in the Island City.

The Houston Automobile Club has sixty-one members and represents about fifty out of the eighty machines in the city. D. J. Palmer is president; Miss Jennie Bering is secretary, and is said to be the only lady secretary of an automobile club in the United States. M. J. Lawson is treasurer and W. D. Byrket is club captain and pace-maker in the different runs. The club holds a regular run each fortnight in season, but the special events are much more frequent and add greatly to the interest. The club has quarters in the establishment of the Hawkins Automobile Co.

There are two garages in the city, with a combined storage capacity of eighty machines. One is that of the Hawkins Automobile Company, thirty machines, and the other the Houston Automobile Company, fifty machines. Another garage is being built by Mosehart & Keller, buggy manufacturers and dealers. It will be larger than either of the others, and the firm, it is understood, is to engage in the automobile sales business.

There are three active agencies in the city, as follows: The G. W. Hawkins Automobile Company, handling the Pierce Arrow, Winton, Franklin and Olds; the Houston Motor Car Company, handling the Cadillac and Aperson; J. Wade Cox, handling the Ford.

The automobile business is five years old in Houston, the first agency having been established by G. W. Hawkins. The majority of the machines owned here have been sold in the last two years. In number the Olds has the lead, having been pushed by the first agency.

The outlook for the 1906 business is

regarded as most promising by all of the dealers, and they expect a much larger business than they have yet had. The tendency, according to the dealers, is for higher priced machines, or rather for those of high grade.

Foreign News Notes.

A donation of \$1,250 has been made by the Automobile Club of Great Britain towards the upkeep of the roads on the Isle of Man, in appreciation of the consideration the club received on the island during the touring trophy contest and on previous occasions.

Measures are on foot in Denmark to remove the present regulations which prohibit automobiling except in Copenhagen and on the chief highways of Denmark during daylight. All roads under parish control are entirely closed to the self-propelled vehicle.

The proposed and postponed English Light Van Trials will not take place in 1906, as in consequence of inquiries made, the A. C. G. B. I. does not think the entries would justify the trouble and time expended.

On February 7 a large motoring dance will be held in Berlin under the auspices of our comic contemporary, *Das Schnauferl*. Several humorous interludes have been arranged, such as a car and boat cake-walk, a "pip-pip" concert, an automobile chamber of horrors and others which will appeal to the automobilists present. The decorations consist of the Herkomer tour route in all its stages from Frankfort over Munich to Vienna and back to Frankfort.

The Scotch Automobile Club has seceded from the A. C. of Great Britain and will seek independent recognition in all automobile countries.

Speedometer and lamp trials will be held in England conjointly with the 4,000-mile tire reliability trials, which have been postponed from February 1 to February 15.

The Ladies' A. C. of Great Britain has fixed the date for its annual gymkhana for June 30, on the Ranelagh Club grounds.

On June 29 the International cup for motorcycles will be run off on the Patzau route in South Bohemia, as Austria carried off the trophy in France last year.

The proposed German automobile tax of 100 to 150 marks (\$5 to \$7.50) regardless of the initial value of the car, is causing grave disturbances in German circles. All automobilists are being called upon to meet and discuss measures to avoid, or at any rate enlighten, the threatened burden, which will mean financial ruin to factories building only light cars. It may not be known that the regulations propose to give foreigners a free stay of thirty days in the empire with their cars. Should this period be transgressed, say because of sickness or a breakdown, the car-owner is not only liable to pay the full tax, but a fine as well. If this measure passes, Germany will soon be sharing the fate of Switzerland, which is now being boycotted by tourists.

Meeting to Discuss Jersey Auto Bill.

PHILADELPHIA, Jan. 22.—A hurry call issued by President Starr, of the Automobile Club of Philadelphia, and President Smith, of the Philadelphia Automobile Dealers' Association, to-day resulted in a big meeting of the members of those organizations to discuss the Frelinghuysen automobile bill, which was introduced into the New Jersey Legislature at Trenton this afternoon.

The meeting was called at the instance of W. F. Sadler, who is chairman of the Law Committee of the Associated Automobile Clubs of New Jersey, and was held in his office in the Pennsylvania building. Mr. Sadler took up the bill section by section and explained the meaning of any involved clauses, devoting especial attention to the more drastic provisions. In his opinion the bill, if it becomes a law, will drive automobilists from the state. Not only will it drive out factories, in which more than \$10,000,000 is invested, but the treasury will lose the license fees of many of the 15,000 automobilists who now hold such permits.

After a threshing out of the subject it was unanimously decided to send a delegation to Trenton to protest against the measure. It was also decided to ask the Automobile Club of America and the New York state clubs to join in the movement.

Some of the more radical provisions of the bill are those which call for the appointment of special automobile detectives; an annual registration fee of 50 cents per horsepower for vehicles and 25 cents per horsepower for drivers; "short-time tourist registration" at \$1 per day; the limiting of the number of cars to be run under a manufacturer's registration to five, and the period for which a person can have a dealer's machine on the latter's registration to five days; the attachment of the driver's photograph to his license; a speed limit of a mile in seven minutes in cities and towns and a mile in three minutes elsewhere, supplemented by the provision that "no speed regulations shall be held to relieve any driver of the consequences of his negligence;" power to arrest offenders without warrant; a fine, on conviction, of not more than \$500 and imprisonment in the county jail for not more than sixty days; permitting any magistrate to revoke a driver's license.

Mr. Sadler said the horsepower registration fee would net the state \$150,000 annually.

A NEW L'HOMMEDIEU BILL.

ALBANY, Jan. 22.—A new auto tax bill will be introduced and pressed in the legislature this year, and if it is perfected to meet the views of the owners of automobiles, will stand a good chance of becoming a law. Senator L'Homedieu, of Orleans County, who had a crudely constructed tax bill last year, will introduce the measure at this session, perhaps this week.

It will impose an annual tax of \$1 per

horsepower on all motor vehicles, save possibly those employed in business, such as trucking or the delivery of merchandise and those of manufacturers' stocks. A revenue approximating \$400,000 a year is anticipated. Senator L'Homedieu has talked his bill over with the Governor's legal adviser, Cuthbert W. Pound, relative to the constitutionality of such a measure and has no doubt that it will stand the test of any court procedure.

TAX FOR STREET PAVING.

Plan to Tax Autos to Help Pave Baltimore Streets.

BALTIMORE, Jan. 20.—Last summer Mayor Timanus, of this city, and J. Spencer Clarke, collector of water rents and licenses, suggested a plan whereby the municipality might increase its revenues by the imposition of a city tax on private automobiles, the idea being to assess them \$1 for every 10-horsepower. Automobilists protested vigorously against the scheme and it was submitted to City Solicitor Bruce, who, after due consideration, declared that it would be unconstitutional.

It seems, however, that the matter was not entirely given up and it has once more cropped out, this time with private horse-drawn vehicles included. Mayor Timanus has appointed a committee, composed of Major Shirley, engineer of the topographical survey, J. Spencer Clarke and Judge Conway W. Sams, to look after the preparation of a bill which will be introduced during the present session of the legislature. It makes no reference to the amount of the proposed tax or license, merely asking that the mayor and city council be empowered to pass the necessary ordinance and to determine the details. It is known, however, from statements by Mr. Clarke, that if the measure is adopted a uniform rate of \$10 will be charged all motor vehicles, while \$2 will be the assessment for a single horse team and \$4 for a double team.

The basis of the whole scheme is the belief of Mr. Clarke and his colleagues that by this system of taxation the debt and interest on a \$5,000,000 loan—to be floated—can be paid in thirty years by the revenue from the tax. The result, they hold, will be the best paved city in the United States and one of the greatest automobile centers in the world. The plan also includes the abolishment of license numbers on cars, the method of registry to be decided upon by the city council. So far as is known the scheme applies only to Baltimore and not to any other city or town in the state, and the improvement of roads will be confined to the district within the city limits.

The Automobile Club of Maryland some time ago announced that it would use every effort to prevent the passage of the measure

and it is expected that it will be contested when it reaches the House of Representatives at Annapolis.

A CONTRAST IN SHOWS.

Megargel Compares the Transcontinental Exhibition with New York Affairs.

BLUE WATER, New Mexico, Jan. 16.—While New York's fashionable society is crowded around the exhibits at Madison Square Garden and the Sixty-ninth Regiment Armory, gazing with admiration at the latest styles of automobiles exhibited by the leading manufacturers of this country and Europe, an entirely different scene is being enacted in eastern New Mexico—yet it is an automobile exhibition that is attracting almost as much attention in this section as are the New York shows in the East. Instead of the mingling of men in tuxedos and opera hats, and beautifully gowned women, as in New York, the spectators here are Mexicans, Indians and cowboys, and instead of moving through crowded aisles, examining first one machine and then another, their entire attention is centered on one little mud-covered, travel-scarred automobile, the first to cross New Mexico and the first to attempt a double transcontinental or a winter automobile trip across the continent.

The remarks one hears are very different from those one heard in the Garden or the Armory. Instead of such remarks as: "Have you seen the new six-cylinder ———," or "the handsome ——— limousine," or "the clutch on the ——— car?" we hear something like this: "Heap big devil wagon; goes without pony;" "How'll you swap that fire-eater for my bronc, stranger?" and "Say, stranger, I don't see no brand on that critter. What is it, a maverick?" Every part of the machine is given the most critical attention; teachers give their school children a holiday while the car is in town, and the Navajo, Pueblo, and even the fierce Apache Indians slink around the corner when the engine is cranked and the open muffler shoots out flashes of fire with a noise greater than that made by the Colts forty-five.

The run of the *Mountaineer* for an entire week registers only about one hundred miles, but every foot of that distance has been gained only after the hardest kind of work in the adobe mud for which New Mexico is famous. This soil clings to the wheels of vehicles until the natives refuse to use wagons during the wet season, doing all their transportation on pack animals. Even these frequently become so hopelessly mired that they are lost. "Dobe" mud is so sticky that the trail made by our auto can be readily followed for a distance of 150 miles, the wheel tracks resembling two plowed furrows. This mud, however, has its value, for out of it are made the sundried bricks from which nearly all the houses in the state are built.

At Gallup two automobiles are owned by

Charles Cotton, son of a wealthy Indian trader, whose trading posts dot the surrounding counties. At Albuquerque, the next large town to be visited by the *Mountaineer*, are numerous automobiles, while machines are owned at Williams, Winslow and Flagstaff, Arizona.

Just which is the worst traveling, mud or snow, is hard to decide, but from our experiences through Arizona and one hundred odd miles in New Mexico, we prefer snow to the mud, even if the water pipes do freeze occasionally and the crew is obliged to bundle up in all available clothing to keep from freezing. Tire chains and tires with studied treads are the only thing in the tire line that will enable us to get traction, and even with all of this equipment the rear wheels spin around and around in the mud.

PERCY F. MEGARGEL.

CINCINNATI MUNICIPAL AUTOS.

CINCINNATI, Jan. 22.—This city expects to use automobiles in three branches of public service—the post-office, street cleaning department and the patrol service. After an investigation of the methods of hauling mail by wagons, it is authentically declared that the Government will install about a dozen automobiles. Already bids are being taken for a patrol for the police department. If this is proved successful, several more will be ordered.

The Board of Public Service will furnish the district superintendents in the Street Cleaning Department with autos to make their rounds. Automobiles will also be utilized for the collection and removal of ashes.

The use of automobile ash carts will be watched with interest, as it is declared by certain persons here that such machines will not prove practical. It is pointed out that the ash trucks will not merely have to run on paved streets, but into the dump ground, and that in wet weather these dumps are as bad as quagmires.

AN AUTOMOBILE ICE BOAT.

TOLEDO, O., Jan. 22.—The fact that there has been no ice in the Maumee river or on Lake Erie this winter is the only reason why Commodore F. M. Underwood, of this city, has not given his new automobile ice boat, *Toledo No. 2*, a trial. Last winter Mr. Underwood ran such a boat on the Maumee river at the rate of forty miles an hour, but his new boat, which has a number of improvements, is geared to eighty miles an hour, and by simply changing a sprocket wheel, can, it is claimed, be made to cover the ice at the rate of 100 miles an hour.

The new boat has two propelling wheels near the front end fitted with sharp teeth which take hold of the ice or snow. They do not support the body, which rests on a pair of broad runners. The driver's seat is well toward the rear, where a wheel steering apparatus controls a rudder plate or blade resting on the ice. Motive power is derived

from a four-cylinder 8-horsepower gasoline engine. The boat is fourteen feet long and is five feet eight inches wide.

GERMAN CLUB CHANGES NAME.

No little sensation has been caused by the announcement of the German Automobile Club that in consequence of the acceptance of the patronage by the German Emperor, the name of the club has been changed to the stately title of the Imperial Automobile Club. Furthermore, the Emperor is having a new club badge designed by a prominent artist, and will bestow it on the I. A. C. as a membership taken under the new name.

The new allegiance between the monarch and the leading German club is only a natural outcome of the interest the Emperor has evinced for automobiling and which actually dates from the Gordon-Bennet race of 1904, when Emperor William was a delighted spectator on the Taunus course he personally had chosen.

NEWS NOTES OF THE CLUBS.

CHICAGO.—The Austin A. C. held its annual election last Tuesday. The following men will serve for the coming year: J. H. Francis, president; C. E. Ingalls, first vice-president; J. E. Plew, second vice-president; C. E. Westwood, secretary; J. S. Wayman, treasurer; J. E. Redmond, attorney; M. B. McBirney, surgeon. The club passed resolutions at the meeting to uphold the laws which govern the speed of automobiles.

CINCINNATI, Jan. 22.—The Cincinnati Automobile Club is making preparations to hold races on straight roads next summer and to organize a number of hill-climbing contests. Entries will be prepared in a few weeks. Already fifteen silver trophy cups have been secured for prizes.

MUSKEGON, MICH.—The Muskegon Motorcycle Club gave a banquet and smoker to the representatives of the press of that city on January 12. The good roads question was discussed in all its phases and a project launched for a new clubhouse.

BUFFALO, Jan. 20.—The annual meeting and election of the Buffalo Launch Club was held Friday night in the Builders' Exchange. The result of the election was as follows: Commodore, A. E. Hubbard, M.D.; vice-commodore, A. F. Dohn; fleet captain, Frank L. Dunbar; secretary, Roger F. Williams; treasurer, Frank X. Argus, Jr.; directors, John W. Ashley, Frank J. Gunnell, George B. Eggbert, Fred Metcalfe. Al F. Dohn and Frank A. Argus were selected as delegates to the meeting of the American Power Boat Association to be held in New York in March. The question of the location of a new clubhouse was left in the hands of a committee. Several sites are now under consideration.

An acetylene lamp should burn silently. A burner that hisses is wasting gas, giving a reduced light and making smoke.

NEW CHICAGO AGENCIES.

CHICAGO, Jan. 19.—The Michigan Avenue Automobile row will see some more changes and additions in the near future. New agencies continue to open quarters while there is no prospect of any old ones removing. This city is rapidly becoming one of the great automobile centers in the world.

One of the new comers is the Cassidy & Fairbank Company, which has closed arrangements with the Cleveland Motor Car Company to act as its agent in Chicago. The new company will have its headquarters on Michigan avenue between Fourteenth and Fifteenth streets; H. J. Cassidy, formerly in the bicycle business, and Dexter Fairbank are the principals in the firm.

The Rainier Company will establish a branch in the city next week, E. Q. Cordner assuming the management with headquarters at 1539 Michigan avenue. S. E. Comstock, who was formerly with T. B. Jeffery & Son, will assist him.

The Lozier Motor Company will open an agency in Chicago in February.

Jerome A. Ellis, a director of the Chicago Automobile Club, is to engage in the business in the near future, handling the Frayer-Miller car. After May 1 his company will occupy the building which the Bennett-Bird Company now leases at 1404-1406 Michigan avenue. Harry N. Taylor, a coal dealer in Chicago, will be associated with Mr. Ellis.

RECENT INCORPORATIONS.

Michelin Products Selling Company, New York (motor cars and appliances); capital, \$100,000. Directors: W. F. Donovan, P. W. Logan, F. P. Reilly.

The West Side Motor Car Company, Hamilton, O.; capital, \$10,000. Incorporators: John E. C. A., Charles C. and K. C. Schmitt, D. Clarence Murphy.

The Hol-Tan Company, Glen Cove, N. Y.; to deal in motor vehicles; capital, \$100,000. Directors: G. P. Tangeman, E. R. Hollander and C. H. Tangeman.

The White Automobile Company, Columbus, O.; capital, \$10,000. Incorporators: C. M. Taylor, H. F. Kruger, W. P. English, C. E. Yoder and J. B. McCaughy.

The Palmer Automobile Manufacturing Company, Ashtabula, O.; capital, \$50,000. Incorporators: Richard Conrad, A. P. Fisk, C. W. Savage, H. Beeder and J. J. Farrell.

The Matheson Company of New York, Huntington, N. Y.; to deal in motor vehicles; capital, \$100,000. Directors: Henry U. and A. P. Palmer, Charles A. Singer and Charles A. Singer, Jr.

Philadelphia Portable Store Company, Camden, N. J.; capital, \$150,000. Incorporators: H. A. Illman, Frank L. Richardson and Wilfred B. Wolcott. The object of the concern is the selling at retail of general merchandise from huge motor wagons fitted up especially for the purpose.

News and Trade Miscellany.

The announcement from Columbus that an appropriation of \$500,000 for this year and \$1,000,000 for next year has been asked of the legislature by the Ohio Good Roads Association has caused considerable satisfaction to local automobilists. Val Duttonhofer, president of the Cincinnati Automobile Club, attended the good roads convention in Columbus, as a delegate.

Delaware was well represented at the automobile shows in New York City, and some Wilmingtonians who were there were so favorably impressed that they talked of having an automobile show in Wilmington. About 100 machines are in use in the city and as they are of almost as many makes, and as there are several agencies and garages there, it is believed that an exhibition of the kind would prove of interest and stimulate the business.

Plans for a third new garage for Toledo, are now being drawn. It is to be erected in the residence portion of the city by L. L. Blood. The proposed building is to be 50 by 100 feet in size and is to be fitted up to take care of automobiles in the most approved way. The automobile business in Toledo is improving rapidly and all the local dealers are receiving numerous inquiries regarding machines for the coming season, which promises to eclipse 1905 as far as 1905 eclipsed 1904.

Plans have been completed for the erection of a three-story garage in Cincinnati, on Sycamore street, near Sixth, by a combination of automobile owners, who declare that garage charges in that city are excessive. The garage will be modeled after those in Eastern cities. The cost of conducting it will be derived from the rental of exhibition spaces, which will be let to local representatives of automobile manufacturers. The building will include a repair shop. It is asserted that fifty automobilists are interested in the venture.

A number of Chicago autoists joined the special train from Minneapolis and St. Paul for Ormond last Sunday, and left for the Daytona races over the Big Four. Among those in the party are: President Henry Austin, of the Oak Park Automobile Club, and wife, Webb Jay, F. W. Douglass and others.

For two weeks prior to the recent opening of the Indiana theatre in Indianapolis, a big touring car was driven through the streets of the city daily, bearing announcements of the opening of the new theatre. The management claims that the scheme brought better results than was anticipated.

Students of the Shortridge High School Science Department, in Indianapolis, are taking special interest in the study of automobile construction. Last week about forty of the students, under a teacher, visited the plant of the Pope Motor Car Company, paying particular attention to the use of storage batteries as applied to automobiles. It is said that other factories in the city will be visited by the class.

The new salesroom of the Foss-Hughes Motor Car Company, at the northeast corner of Broad and Race streets, Philadelphia, was opened to the public on Monday. Flowers and music added to the interest of the display, which included several of the cars which were in the New York show exhibits of the Pierce-Arrow, Cadillac and Baker Electric concerns, of which the Foss-Hughes Company is the local representative. The Quaker City Automobile Company (Franklin, Oldsmobile and the Pope

line) and the Hamilton Auto Company (Stoddard, Dayton and Corbin) are having similar individual shows.

The discovery of a tire lever inside of a tire by Dr. A. C. Helm at Milwaukee, has caused no little comment at the Diamond factory. The tire was a Diamond, and the lever had been between the tube and the case for six months without being noticed. The piece of steel is twelve inches long, an eighth of an inch thick and an inch wide. It developed that Dr. Helm's machinist dropped the lever in by mistake when putting the tire on.

J. D. Hawks, president of the Detroit & Mackinac Railroad, has offered to further the good roads movement in Michigan by delivering along the right of way of the railroad at any crossing gravel enough to build fifteen miles of highway. The delivery will be made without cost to the township other than the actual cost of the material. The road will probably be built in Arenac county.

The Decauville Automobile Company, of New York, after considerable delay, has moved into its new garage at Fifty-sixth street and Broadway, and the three establishments formerly maintained at Thirty-eighth street, Thirty-ninth street and on Broadway have been concentrated under one roof.

W. Gould Brokaw has ordered from Audineau & Co., the Parisian body builders, an enclosed body of unique character to be placed on a 50-horsepower Fiat chassis. The car will be a sort of "cruiser" and will have seats which can be made into a berth for sleeping; there will be a washstand and complete toilet fittings, an ice-box, provision storage, electric lights and numerous other conveniences, so that a small party can indulge in long "land cruises" without having recourse to hotels.

The "Ultra" compound tire pump, heretofore manufactured by the Ultra Pump & Power Company, of Auburn, N. Y., is now being made by the Bridgeport Brass Company, of Bridgeport, Conn. The change has been made because the original manufacturers, who are the owners of the patents, had not the facilities necessary to meet the increasing demand and cast about for means to enable them to place the pump on the market in larger quantities. The name of the pump has been changed to the "Deno." The trade will be supplied by the Bridgeport Company, while the Ultra Company will attend to individual orders. It is stated that the Bridgeport Brass Company subjected the pump to thorough tests before undertaking its manufacture.

The Matheson Motor Car Company, Holyoke, Mass., announces the establishment of a New York agency at 1619 Broadway, as temporary quarters until the completion of a garage, which is to be erected at an approximate cost of \$500,000, the site of which has not yet been determined. The entire output of the company has been sold to a selling agency which will be known as the Matheson Company, of New York, the principals in which are Charles A. Singer, of New York, and Henry U. Palmer, of Brooklyn.

Agencies for the Queen and Mitchell cars for 1906 have been placed with the D. B. Sullivan Auto Company in Indianapolis. The company had the agency for the Queen last year, while the Mitchell had no special representative in the city.

A company for the manufacture of auto chimes has been organized in Indianapolis.

It will be known as the Auto Chimes Company and will be managed by D. B. Sullivan, who is also manager of the D. B. Sullivan Auto Company. The chimes are of square tubing bolted and riveted together. Funnel-shaped distributing castings are used and it is said that a man can blow the horn with his breath. A three-way butterfly valve of an improved type controls the pressure, which does away with back pressure on the engine while the chimes are being blown.

M. Rothschild, the American member of the firm of Audineau et Cie, has made the announcement that, on March 1 he will open a factory in New York, where the bodies built in France will be finished for the importers who are sending him hurry orders and for several prominent American manufacturers who desire Audineau bodies for their high-powered chassis. This finishing factory in New York will be run under the supervision of a Parisian superintendent, educated in the Audineau ways and styles.

The Cuban consul at Philadelphia, has been instructed by his home government to announce to those contemplating visiting Havana at the time of the automobile races there that all traces of yellow fever have been eradicated and that Cuba is free from all contagious diseases.

The National Auto School, at Carlisle and Oxford streets, Philadelphia, has just opened with large classes under the instruction of Manager J. Frey and a corps of experts.

The last toll-house within the limits of Philadelphia county was wiped out last week when the local rapid transit company paid to the Cheltenham & Miller Grove Turnpike Company \$20,000 damages for the discontinuation of all toll-gates on the old York road from Erie avenue to the city line.

Recently elected officers of the Professional Chauffeurs' Club of America, effective for 1906, are W. H. Walter, president; Fred. Brevogel, first vice-president; C. Schmidt, second vice-president; Emile Stricker, treasurer; F. N. Walch, recording secretary; M. J. McGuire, corresponding secretary.

Fred I. Tone, who was until recently connected with the Marion Motor Car Company, is now general manager of the American Motor Car Company, Indianapolis, Ind.

"Seeing Salt Lake City in an automobile" has been made possible by the Auto Sight Seeing Company, of which L. C. Snow is general manager. The company has mapped out a route covering the places of interest in the city, a distance of almost twenty miles, and a charge of \$1.00 per passenger is made.

Among the visitors to the two shows last Thursday was J. W. Thompson, who first drove a Locomobile in Japan. He came home from the Flowery Kingdom only three weeks ago, and when he returns next fall he will take with him a 30-35-horsepower Locomobile, which he bought in the Garden. Mr. Thompson says that automobilism has made comparatively little progress in Japan, although the roads are well adapted for motoring. He ascribes this apparent backwardness to the large import duty, and believes that when this is removed or modified American machines will find Japan an excellent market.

THE AUTOMOBILE

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No. 6

CHICAGO SHOW A MAGNIFICENT CREATION.

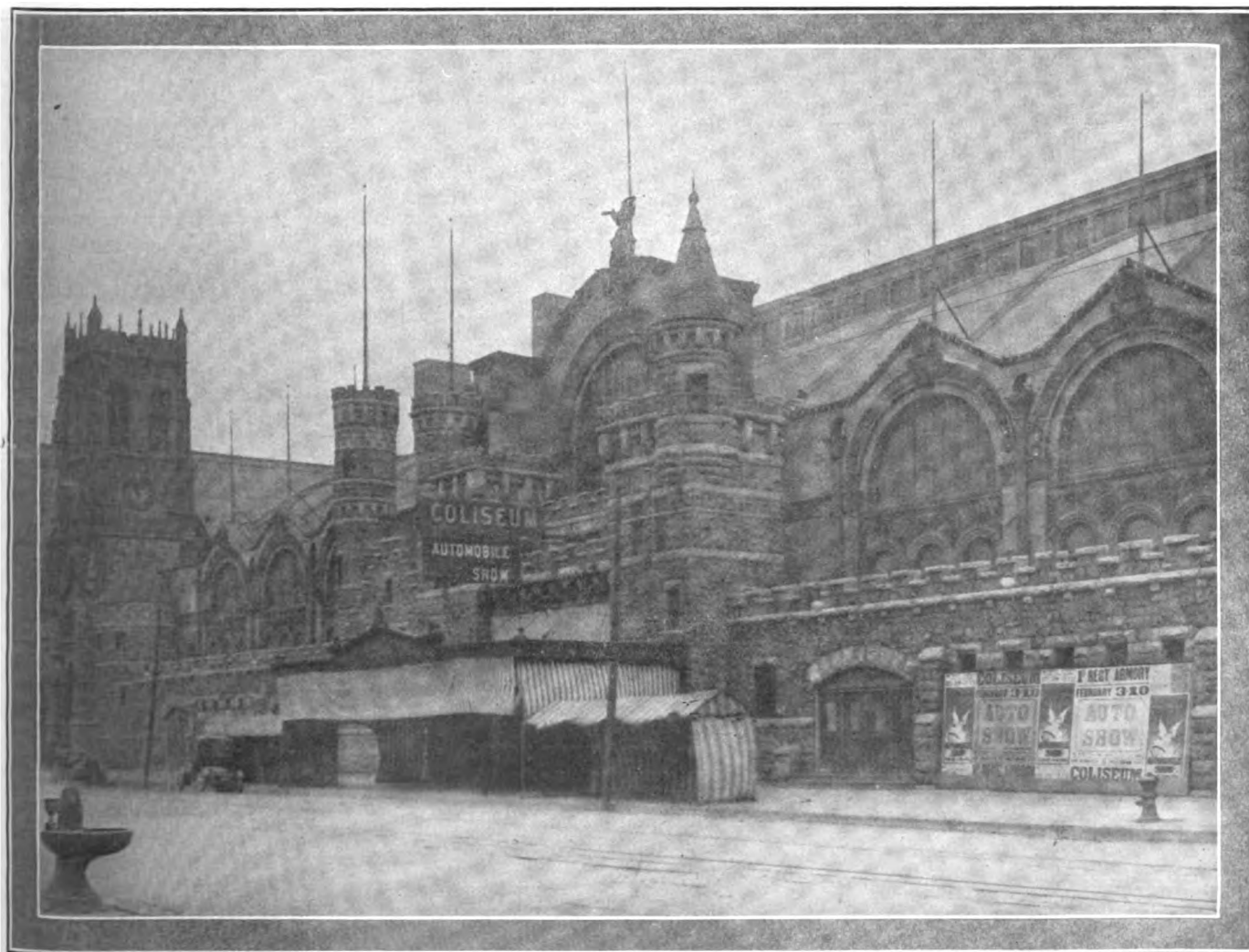
CHICAGO, Feb. 5.—New York's automobile show has been transplanted in the Coliseum and the First Regiment Armory of Chicago to fuller degree than most exhibitors may have realized. But while the Chicago visitor who was at New York admits this, he will insist that in Chicago, the exhibition has been housed with a show of good taste and artistic effect that excels the New York exhibitions. The

two buildings stand back to back on the same alley and a hundred yards apart, a covered way out of the Coliseum annex leading to the alley, down one side of the alley and opposite the rear of the First Regiment show place, where the first break is made in the clean, clear gangway which makes the two shows one.

Not the least interesting place of the fifth annual show in Chicago is this boardway,

nearly six feet wide, which unites the two buildings. It becomes at once an impromptu promenade along which double rows of visitors move at all hours under the long lines of electric lights, back and forth, a party frequently dropping into march step to the chanted air of some popular operatic bit and violating all rules of bridge maintenance in the measured beat of shoe soles.

And from either of these buildings at



COLISEUM BUILDING ON WABASH AVENUE, CHICAGO, WHERE AUTOMOBILE SHOW IS IN PROGRESS, SHOWING SHELTERED MAIN ENTRANCE.

which the visitor has entered the passageway is worth while, even without the novelty of a winter promenade in the warmth, light and dry.

The Coliseum building, fronting main transportation lines, is the chief entrance for visitors, just as it is the chief show place of the two. Its magnitude over the other building has allowed of a scheme of decoration which, while carried out as far as possible in the smaller place, cannot distinguish the effect as seen in the Coliseum. But on the other hand the quality of the exhibits in the smaller building holds an interest out of proportion to the great building in Wabash avenue.

Manager S. A. Miles for the Chicago exhibition has said that \$30,000 was expended in preparing for the show, and when one considers the acres of white and gold muslin fabrics draped and twisted into the roof spaces—the miles of yellow silken banners depending above the lines of exhibit limits—the black and gold staff pillars and the green and gold cornice effects strung upon them for the length of the buildings, and out of these rising great yellow globes of light fourteen feet up—the scene at once is suggestive of costly stage effects hardly to have been expected of an automobile show.

No setting for the automobile has ever been attempted in Chicago in such rich simplicity of effect. Tons of staff have been molded and modeled merely for the lettering of exhibitors' names above the booths. Each letter of a name stands in relief in white from a background of black and gold, swinging independently of its fellows from the stuccoed green-and-gold beam overhead and the groupings set off on a drapery of yellow silk. Hung from the roof arches are groups of arc lights whose white rays are tinged to a soft yellow before they reach the floor and there in the striking exhibition of colors shown in the automobiles themselves and in the dress of women visitors who lend so largely to the attendance, the garden effects of the exhibition may be expected to attract thousands who will have not the slightest idea of inquiry into the merits of one automobile over another.

Over the automobile show in New York this Chicago show presents some features of attendance that are worthy of note. For instance, the small boy here is in numerous evidence. He comes in gangs at times, scuttling in and out of the crowds and the exhibits, tooting a horn here, whirling a wheel there, and at all times a collector of literature on the subject of machines. He is a boy, first, utterly unconscious of others than himself and worming his way through as if those about him were trees. He has the Western nervousness of his climate and a precocious knowledge and interest in machinery and decorative finish that persons of greater maturity and material interests in the automobile might emulate to the well-being of the industry.

His small sister and his matronly mother are not so numerous, but his big and pretty

sisters, his older brothers with other brothers' sisters on their arms, his downtown business father and his cattle country uncle in the wolfskin and bearskin coat are here, and from the salesman's point of view they are well worth the attention of the sales department of agency and factory.

Noticeably the Western car calls for colors that are absent in the Atlantic coast states and the Western East. Some of these cars are vivid in their markings and it is significant that some of these at any hour are found with groups of brightly dressed women resting in the tonneaus. Picture hats and pretty gowns and wraps heaped into these cars might be a part of the color scheme at night were it not so plain that the whole grouping is to be taken as an expression of approval of colors in a vehicle.

There is every incentive for dress in the arrangement and furnishings of the show itself. The long lines of exhibit spaces are covered with a soft carpeting of dark green material, with a marginal strip of dark red. The passages between are of smooth flooring, waxed, with an air of cleanliness and order manifest everywhere. Chairs and desks and tables are everywhere inviting rest for those who would talk merit in machines and accessories.

A Chicago winter of exceptional openness and mildness may have contributed to the overwhelming percentages of open cars on exhibit. Certainly there are surprisingly few of the closed type shown in contrast. It has long been remarked of the horse vehicles in Chicago that the old-fashioned "top buggy" of this city is characteristic of Chicago alone of all the great cities. There are more of them here than in any other great city in the country and they stand at every crowded corner downtown. But in contrast to this the large number of open cars and the unmistakable popular interest in the type may be taken as another proof of an old fact, that out of hand "you never can tell."

Another interesting observation of the Chicago show is that there are more foreign cars exhibited than ever before and, at the same time, more interest than in recent years in the runabout types of machines in the booths. And while the small runabout attracts to it more earnest inquisitiveness as to cost, operation and maintenance, the costly foreign car holds its crowd of another selection and awakens inquiry and interest that are unmistakable.

Between the crowds that jam around the runabout types and the groups which are asking as to the merits of the costly foreign and domestic manufactures, even the laymen may read the evolution of the automobile business. The person who has been driving a horse to an old-fashioned top buggy is considering the departure to an automobile of handy, runabout pattern, while the wealthy man, who has experimented to his satisfaction with the automobile as an experiment, is showing his pur-

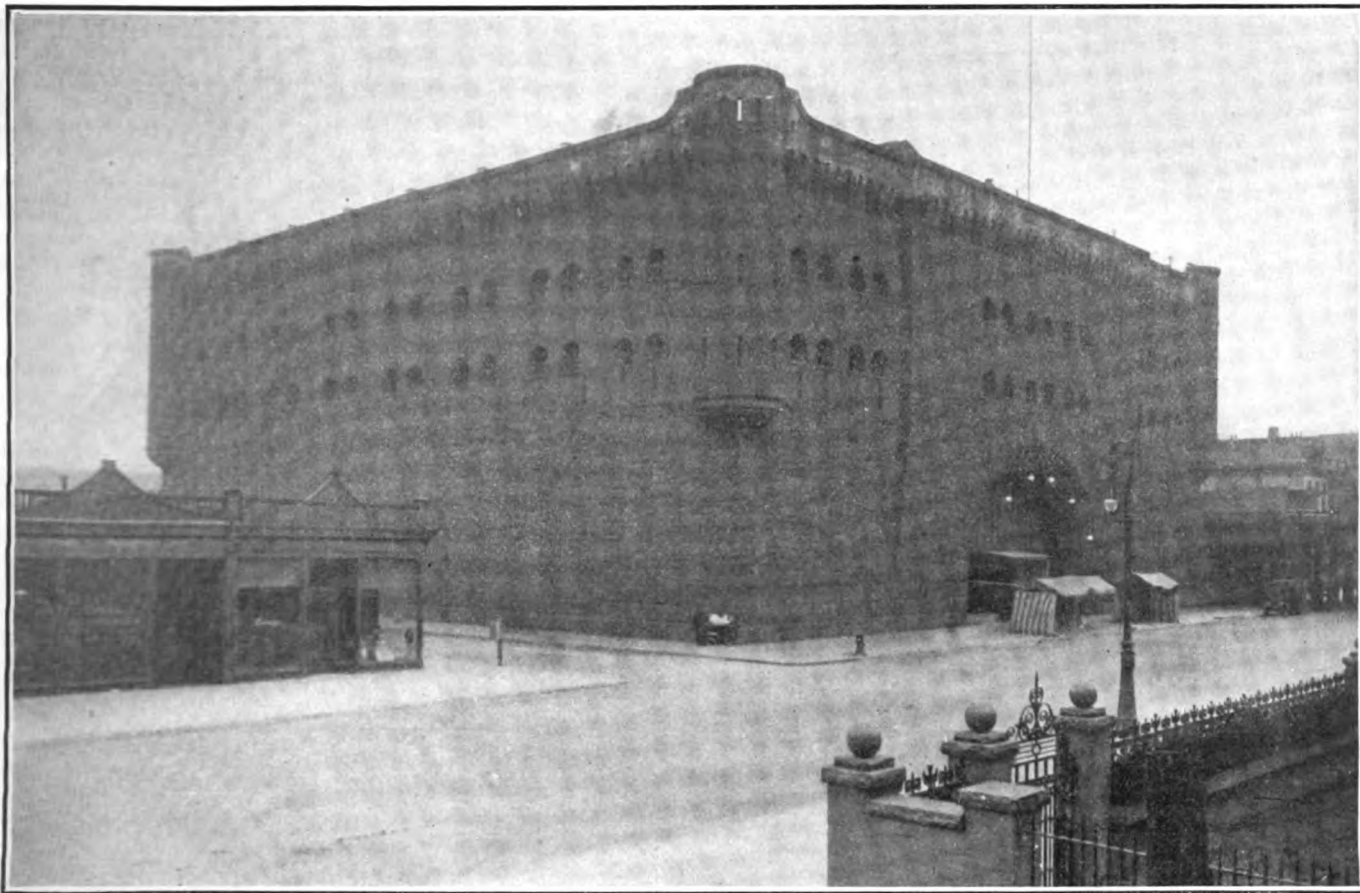
pose toward a costlier investment in a car of higher quality and development.

That this element of quality is entering every year more and more into the public mind is shown in the disposition of the exhibitor to set the open chassis of his machine side by side with the finished product of his factory, and, not content with this, he has now piled its working parts around it on tables or housed them in neat cabinets as a background for his exhibit. The individual interest of the visitor shown toward a rough forging as well as to the mirror finish of the completed part is to be taken as evidence of the public's education in the automobile.

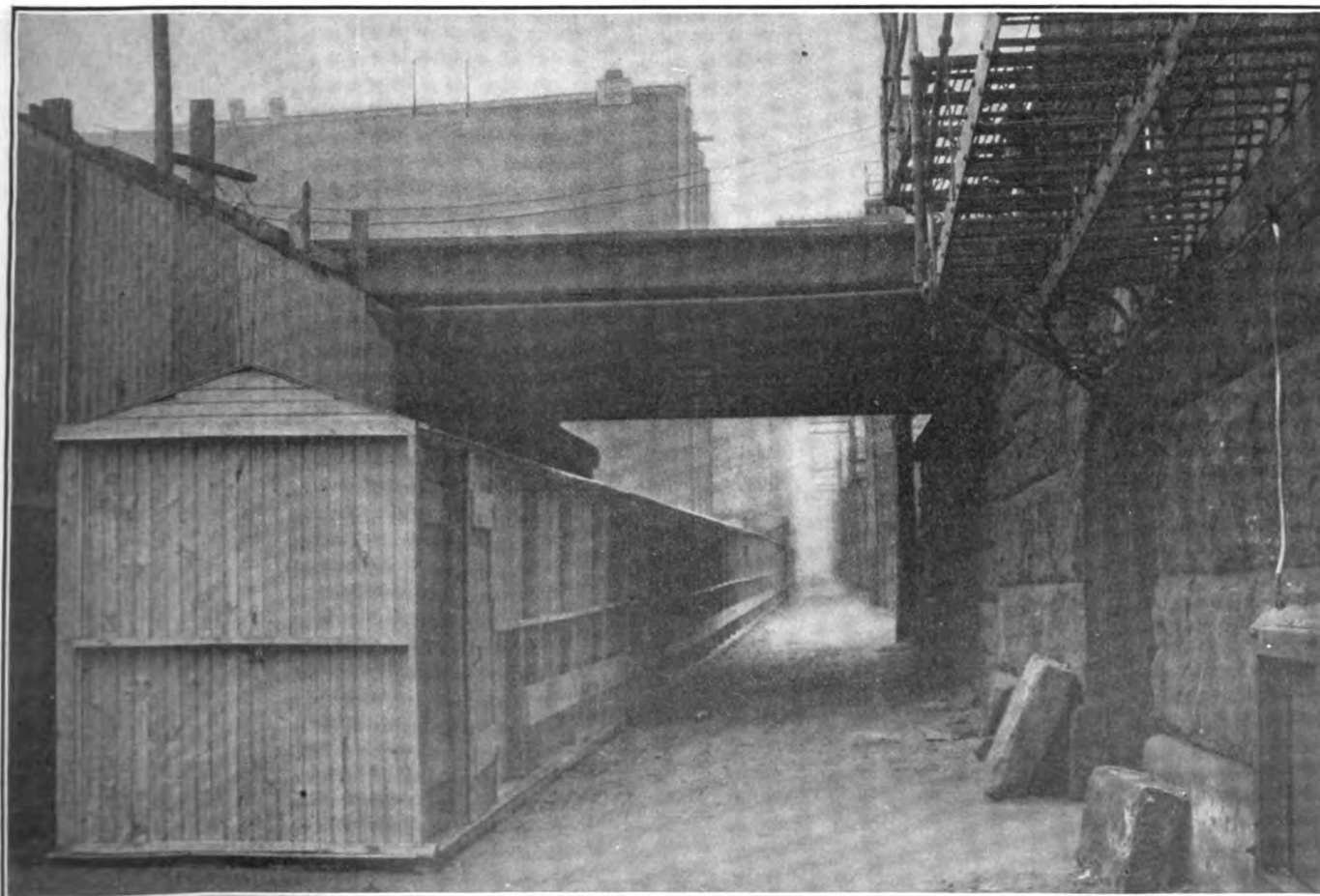
One of the chance features of the show that will not be overlooked by the interested visitor is the comparatively small section of the south annex of the Coliseum itself, which by some unstudied chance holds within itself the widest possible range of cars as to manner of propulsion. Steam, electricity and gasoline are represented here, with one of the great foreign cars attracting to it the studious interest of those whose possibilities of purse make it a serious study. Here in this little niche of a great show the novice, too, may go for his first practical insight into the applications of power to the automobile, and may leave with little else of fundamentals to learn.

This statement leads naturally to the element of salesmanship as it has been shown here. Never before were exhibitors called upon to get closer to the facts and to the answering of pertinent questions from those who know than are the attendants upon the booths at this fifth Chicago show. That this is appreciated already is shown in the bearing and attentiveness of those in charge of exhibits. There is a spirit of wideawake appreciation of the work of exhibiting on all sides. The manufacturer himself whose interests might well leave him to other activities, may be seen at his booth in the evening, dressed as for something other than business, bowing his recognition in a social way and yet as easily stooping over a gearbox or motor or sparking apparatus in a chassis, explaining as he would have employees do for him at factory or salesroom. The presence of such men has had a marked influence upon the exhibiting demonstrator in general, until in the showy evening crowds the element of slouchiness that is so easy of creeping in on the part of attendants has become hard to find, even for the purpose of showing a bad example.

Considered as a whole, the exhibition in Coliseum and Armory is such in environment as to do away with the old rough-and-ready methods of shop and store front salesroom. With excellent orchestras banked high up in the draperies of the roofs, with uniformed attendants on all sides, and the atmosphere of refinement everywhere through the promenading crowds, the impulse is for a homogeneity in all things. And it is there. From the galleries in the Coliseum especially, a glance down and up



FIRST REGIMENT ARMORY, MICHIGAN AVENUE AND SIXTEENTH STREET, USED FOR OVERFLOW FROM COLISEUM SHOW.



SIX-FOOT COVERED PASSAGE, 300 FEET LONG, CONNECTING REAR ENTRANCES OF THE COLISEUM AND ARMORY, ERECTED ESPECIALLY FOR THE OCCASION OF THE PRESENT AUTOMOBILE SHOW, FEBRUARY 3 TO 10.

conveys at once the artistic simplicity of the show. There is not a cranny in which a softened and yet sufficient light is not sent in search of convincing effects, or of *outré* grotesqueries. And this golden glow, whether of the winter sun in daylight through the glass roofs, or of the electric bulbs and arcs at night, makes plain the beauties of pavilions and exhibits.

In the long reaches of the Coliseum one sees the three long beams of stucco stretching away above the canopies and open tonneaus of the cars, fringed with yellow silk and set with yellow lights, each of these girders effects the dividing line between exhibits fronting right and left. All round the paneled walls in black and gold, the long

rows of exhibits look out under the gallery widths from a fringing of silken drapery. And tier on tier above, the accessories of the automobile are ranged in almost countless diversity.

A birdseye map of mathematical design lies under the observer from above with every vestige of mathematical harshness obliterated in light and color. Music and flowers and ferns, with classic pavilion effects led to the harmonious whole. Even the New Yorker, looking down upon the presentation of this fifth annual Chicago show, may nod his head if he will to the frequent remark of the Chicagoan:

"Say, this lays it all over the New York show, doesn't it?"

Cars and Components in the Coliseum.

WHEN the facilities of available buildings are taken into consideration, the advantages of a double show for providing space for the proper exhibition of cars were plainly evident in the Coliseum, just as they had been previously in the Garden show in New York. Curiously enough an armory building in each instance provided floor space for the overflow, and, as at New York, the overflow has so many points of special interest all its own that it is difficult to treat of the Chicago show as composed of two separate exhibitions—one would not be complete without the other. To those who had carefully scrutinized the exhibits at the New York shows there was a disappointment in the display in the Coliseum; for after walking the several thousands of yards of aisles under the roofs of the two buildings there was something very familiar about the exhibits on view. It was more than ever before a new edition of the New York display, with a different binding and dress, but the same fund of information. To be sure there were some novelties, or, more correctly, the appearance of some exhibitors who had not displayed in New York. The number was not large, nor, indeed, were such exhibits as conspicuous as those which had been displayed at previous shows.

This first impression had hardly been mentally recorded, however, before the sophisticated visitor recalled that the Chicago show was for residents of the middle West, and to those who had been waiting for this display at their own doorstep it was quite as novel and fully as interesting as the New York presentations. In the technical and trade press no doubt most of the knowing ones who crowded the Coliseum on the opening night already had read about the cars on view; but here was a chance to compare the written reports with the reality and to get the mental perspective and the physical stereoscopic effect that a good pair of eyes in front of a discriminating mind can enjoy.

Aside from the question of novelty, which is purely comparative, the Chicago show of

1906, considered apart from other shows of the year, is notable for the increase in the number of exhibits of foreign cars. Hitherto the foreign car has been a good deal of an exotic at the Chicago show—an orchid, as it were, that satisfied curiosity, perhaps, but which did not awaken any such interest as the domestic growths. With few exceptions the exhibits of foreign cars were to be found in the Armory, the Coliseum being devoted almost entirely to American machines.

Another and rather unexpected feature in the Coliseum is the prevalence of open cars, though in most instances provision is made for protection against dust and rain by folding tops of the Cape cart or victoria type. The inclosed car is not slighted, and permanently inclosed car bodies are on view in considerable numbers, especially on machines that might be termed "town cars."

In point of ensemble the Chicago show, especially in the Coliseum, takes high rank. The scheme of decoration and the general air of almost scrupulous cleanliness and of "a place for everything and everything in its place" is notably artistic and harmonious. General Manager Samuel A. Miles has indeed given the Chicago public a delightful surprise and has set a new standard for exhibitions in the west.

The general arrangement of floor space of previous shows has been adhered to with aisles running the length of the building and crossing the hall at the center and at the ends, giving the stands a general rectangular form. The alcove spaces under the galleries and between the lower ends of the great roof arches, formerly bare and unattractive, are made very inviting by paneling of weathered wood and tinted bur-lap. As previously touched upon, the addition of the Armory floor area has made it possible to give exhibitors large spaces for the display of complete cars, and the stands are so disposed that there is a good deal of room for the visitor to move about in when making examinations.

In the Coliseum proper the largest spaces are occupied by the Pope interests, the Elec-

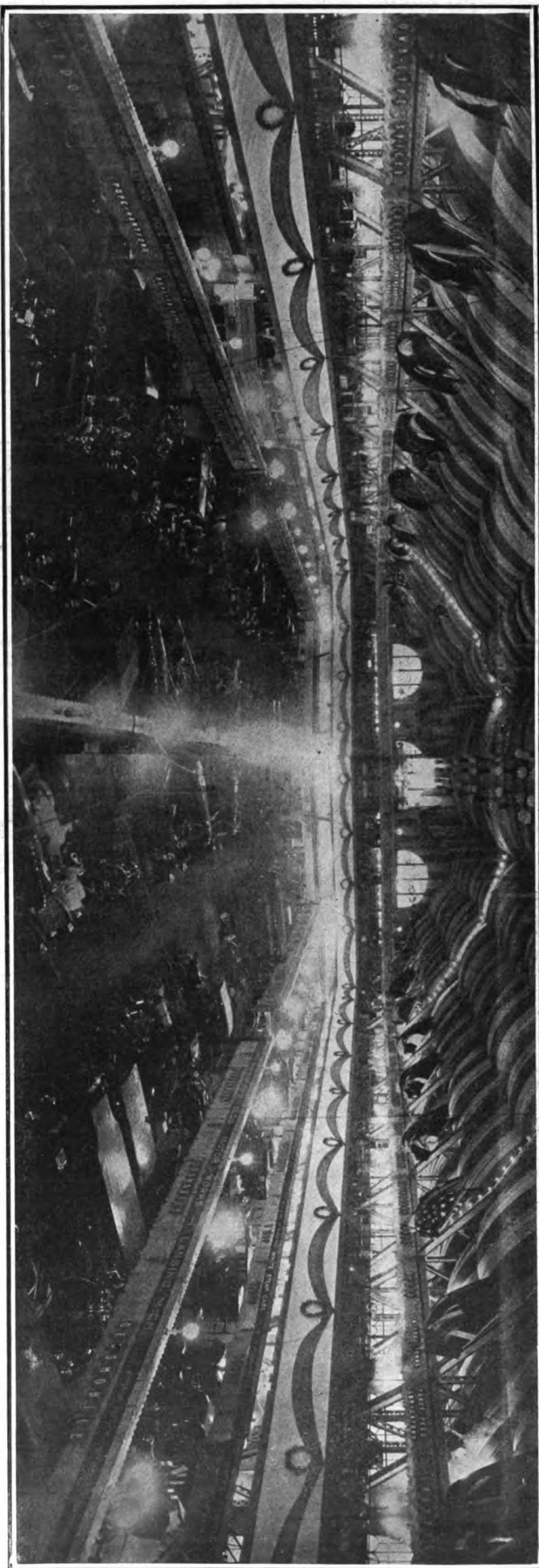
tric Vehicle Company, Thos. B. Jeffery & Company and the Olds and Knox exhibits. Of scarcely smaller size are the stands of the Woods Motor Vehicle Company, Locomobile, Packard, Peerless, National, Thomas, Franklin, Pierce, White, Orient, Royal, Cadillac, Winton, Stevens-Duryea, Mitchell, Premier and several others equally well known. Licensed and independent makers are side by side, and a feature of the display is the keeping together of all the products of one plant, whether electric or gasoline, for pleasure or for commercial use. To some makers this gives an opportunity for a more imposing display than was possible in New York, where the different types of cars were in general kept separate. A notable example of this is at the Knox stand, where the big new four-cylinder touring car shares space with the familiar motor under the body cars and with several machines for purely business uses.

The largest display by a local concern is that made by the Woods Motor Vehicle Company, which shows a number of electric vehicles of the carriage type and two examples of its gasoline touring car, one a limousine and the other a side-entrance touring car with victoria top, both fitted with four-cylinder vertical motors of 45 horsepower. One of the electric vehicles—a victoria—is shown in natural wood finish of light color! the car driven by side chains. Another car of quite different type, but finished also in natural wood, is the Orient buckboard which, in its improved form, and sold at a low price, is always a center of attraction and interest. Crowds also surround the Ford runabout, just as they did at the Armory in New York. With bonnet removed and buggy top in rainy-weather position it shows a curious combination of the very modern and the old familiar.

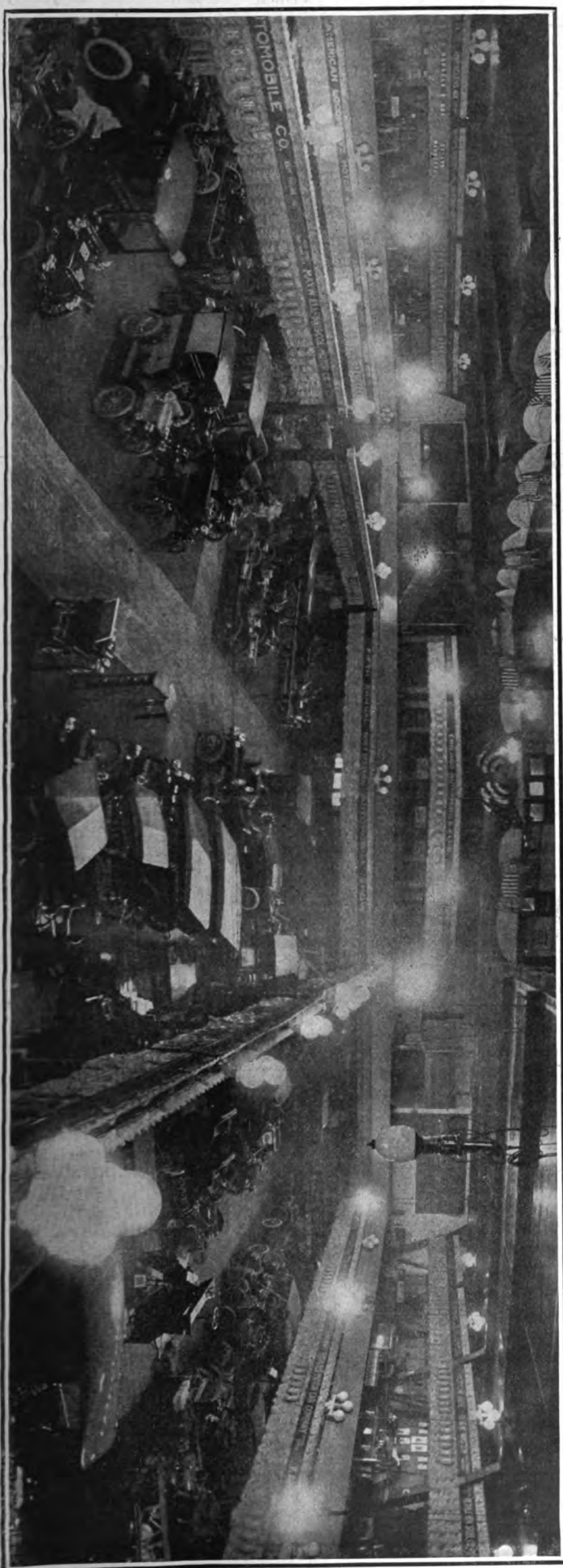
The Northern, both in chassis and complete car, draws a crowd at the other end of the hall and its many original features keep the salesmen quite as busy making explanations, as at the Garden show earlier in the year.

At the Locomobile stand the big Vanderbilt cup racer, piloted to a place by Joseph Tracy, shared the interest of a great throng with the various chassis and complete cars on view. Near by is the beautifully polished Packard chassis, which is expected at all shows and is a landmark here. The Packard runabout at this stand is a notable exhibit. In this car, on account of the comparative shortness of the body,—seating three—the designer has had a free hand in the relative location of parts and the engine is set well back of the front end of the frame in the most approved Continental fashion. The long, raking, diagonal, front mudguards connected with the frame by inside leather extensions help the general smart, "racy" appearance of the car, making altogether an extremely up-to-date combination.

To Chicago visitors the Olds line is an



PANORAMIC PHOTOGRAPH OF INTERIOR OF CHICAGO COLISEUM TAKEN FROM SOUTH BALCONY AND SHOWING FIFTH ANNUAL AUTOMOBILE SHOW IN PROGRESS THIS WEEK.



GENERAL VIEW OF INTERIOR OF FIRST REGIMENT ARMORY, WHICH FORMS AN ANNEX OF THE COLISEUM—PARTS AND SUNDRIES EXHIBITS IN BALCONIES.

interesting one, for it is a novelty here. There is a comprehensive display of runabouts, two-cycle and four-cycle touring cars, an opera bus and an open carryall. The Holsman car is a peculiar and familiar Chicago product and is shown this year not only in the single seat type, but with surrey body also. This car, it will be recalled, has the general exterior lines of a buggy, including the wheels. The motor is of the double-opposed air-cooled type and the drive is by steel cable from sheaves on the countershaft to pulleys of large diameter concentric with the rear wheels and attached to the spokes.

As never before, the builder of complete cars has taken the purchaser into his confidence in materials of construction, which are shown in the rough, partly machined, and fully finished state at many stands. At

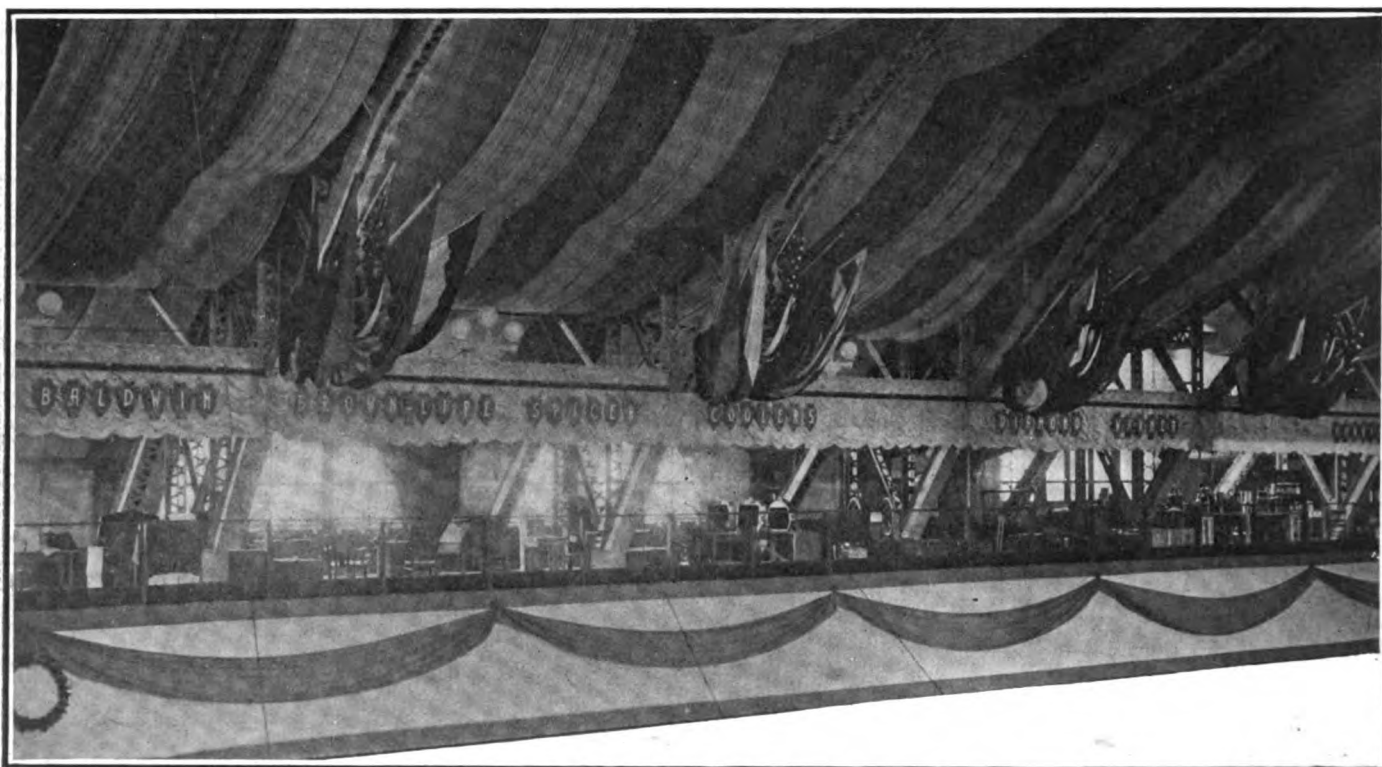
businesslike appearance. Of this type the Autocar touring car chassis, finished in dark blue and aluminum, and the Peerless in black and aluminum, are pretty pieces of work. In the 1906 Peerless a readily noticeable change is the adoption of hubs of equal size for front and rear wheels—a decided improvement in appearance upon the unequal sized hubs which hitherto have been characteristic of this machine.

At the Haynes stand two polished chassis are on view, each without radiator. In this car the engine is set well back from the front, the length of the frame making this possible, and this feature is accentuated by the absence of a radiator, which would be about in line with the front axle. The frame is tied at the front by a cross bar, that certainly safeguards the radiator in case of a head-on bump.

cessories and fittings is seen in great diversity, and, taking the cue from the general artistic scheme of decoration of the hall, the exhibitors have arranged their wares with unusual care. The result is an attractiveness that is sure to meet with a public response before the show is over.

Coliseum Annex.

In the light of a rather extensive experience in visiting automobile shows, it is difficult to recall anywhere a more comprehensive display of interesting things than are contained in the main floor and second story of the annex to the Coliseum. On the main floor the exhibit is in effect one with the Coliseum proper, for the main floor openings in the dividing wall are large and the visitor passes from one place



SECTION OF BALCONY IN COLISEUM, SHOWING EXHIBITS OF PARTS AND SUNDRIES AND ELABORATE DECORATIONS OF RAIL AND ROOF.

the Thomas exhibit a great wood panel is covered with components, chiefly drop forgings.

Six-cylinder cars are likely to be as much discussed here as in New York. The Stevens-Duryea exhibit includes a six-cylinder chassis and also a complete car, the latter with hubs of peculiar shape and of great size, recalling the famous "barrel hubs" of the Whipple Packard. To those who pride themselves on being able to pick out any car on the street, these hubs will be a valuable memory jog.

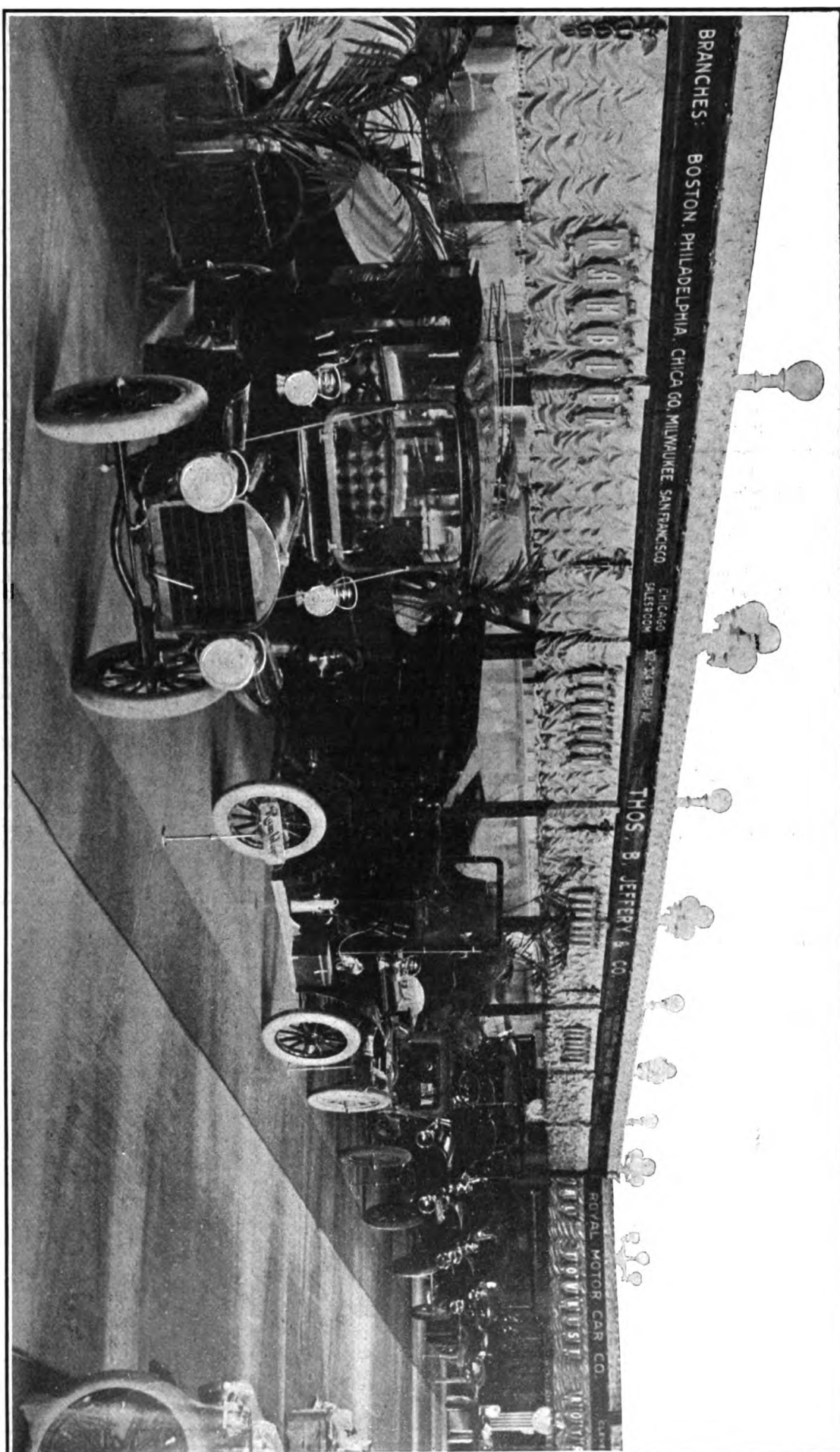
Following the now established show custom a great number of builders of cars exhibit complete chassis. Some of these are in nearly, if not altogether, the ordinary shop finish, and though not quite as interesting to the uninitiated as the show-finished chassis, they have an extremely practical,

So thoroughly is East and West mingled at this show that a visitor who has lost his sense of geographical location could hardly tell where it was being held from an inspection of the exhibits of cars. There is just a possibility that he might make a correct guess after a digestion, or rather indigestion, of the color schemes. These are so peculiar—original, perhaps—that if persisted in would cause the term of reproach "Get a horse" to fall into disuse, for certainly no spirited beast accustomed to the decorous color treatment of carriages would willingly consent to draw such a vehicle without blinders. Indeed, some of these "artistic creations" produce in the unaccustomed visitor about the same sensation as eating an unripe persimmon.

In the gallery surrounding the main floor of the Coliseum the familiar display of ac-

to the other without realizing it. Taken apart from the main hall the annex contains within its walls a very satisfactory show in miniature. Including both annex floors there are on view electric, steam and gasoline cars, for both pleasure and business uses, and the gasoline types range from typical American runabouts to the 1906 Mercedes touring car. And in gasoline motor equipment the choice can be made anywhere from the single horizontal water-cooled to the four-cylinder vertical air-cooled; or the compound may take one's fancy and a stop can be made to inspect a two-cycle motor exhibit among the component parts. There are still awaiting attention the friction drive transmission and an extensive exhibit of the motorcycle or "poor man's automobile."

Besides the complete cars, the whole



EXHIBITION STAND OF THOMAS B. JEFFERY & COMPANY IN THE COLISEUM, ON THE MAIN AISLE, SHOWING CHARACTERISTIC SCHEME OF DECORATION.

range of supplies for the user are shown, and many for the builder also, so that whether gears or batteries, clothing or lamps are the objects of interest, there is plenty to occupy one's attention.

In the main floor two adjoining stands show very appropriately products of Chicago shops. The new "Chicago" steamer built by the Chicago Automobile Manufacturing Company, and the old-established Tincher gasoline touring car. In general exterior form the steamer appears familiar, though here the likeness to anything on the market practically ends. A large bonnet with condenser in front and water tank at the back in front of the dash, covers the coil pipe, semi-flash generator. This is piped to a four-cylinder, single-acting trunk engine set under the footboard with the cylinders inclined. Drive is by propeller shaft to rear live axle. Both a chassis and a complete side-entrance car are shown.

In the Tincher exhibit, alongside, two cars are displayed. One is a 70-horsepower open car with a spacious straight-line body modeled on Napier lines, and the other a 50-horsepower limousine. The former is of the now familiar vertical motor-in-front type of this builder and was borrowed from a customer for exhibition use. It brought back memories of Théry's 1904 Gordon Bennett winner which carried conspicuously on its sloping dash two large oilers.

On the main floor other extensive exhibits were made by the Vehicle Equipment Company, the Welch Motor Vehicle Company and the Jackson, Auburn, Austin, Buick and Pierce Engine companies among others.

On the upper floor several exhibits of cars are seen this year. One of the most interesting is not made with a view to creating sales of cars, the vehicle shown—though

a product of the shop of the exhibitor—not being for sale. This interesting car is at the stand of the Chicago Pneumatic Tool Company and is one of a lot of fifty made by this concern for the use of its salesmen located in various parts of the country. The company has found that by supplying each agent with an automobile he is enabled to transact a great deal more business in a given time than he would be if he had to depend upon other methods of transit. Last season the company purchased several cars in the market, and from the experience gained with those machines the car on view was constructed. It is a 22-horsepower, four-cylinder, motor-in-front runabout with divided front seat, and beetle back made unusually deep to hold samples. It has a cone clutch, three-speed sliding-gear transmission and shaft drive. The wheelbase is 90 inches, tread, 56 inches, and wheels, 30 by 3 1/2 inches. It is apparently very strongly built to stand a lot of hard service.

On the opening day there were no exhibits in place at the stand of the American Motor Car Company, of Indianapolis, or the Harrison Wagon Company, of Grand Rapids. A creditable exhibit of complete cars is made on this floor by the Dorris Motor Car Company, and there is an interesting assemblage of electric carriages made by the Columbus Buggy Company. The Aerocar shows its new air-cooled touring car. Chassis with friction transmission are shown at the "Gearless" and "Windsor" exhibits. Another notable exhibit is the 35-40 German Mercedes 1906 model shown by the Mercedes Import Company, of New York, which has established a Chicago branch. Indian motorcycles are shown by the Hendee Manufacturing Company.

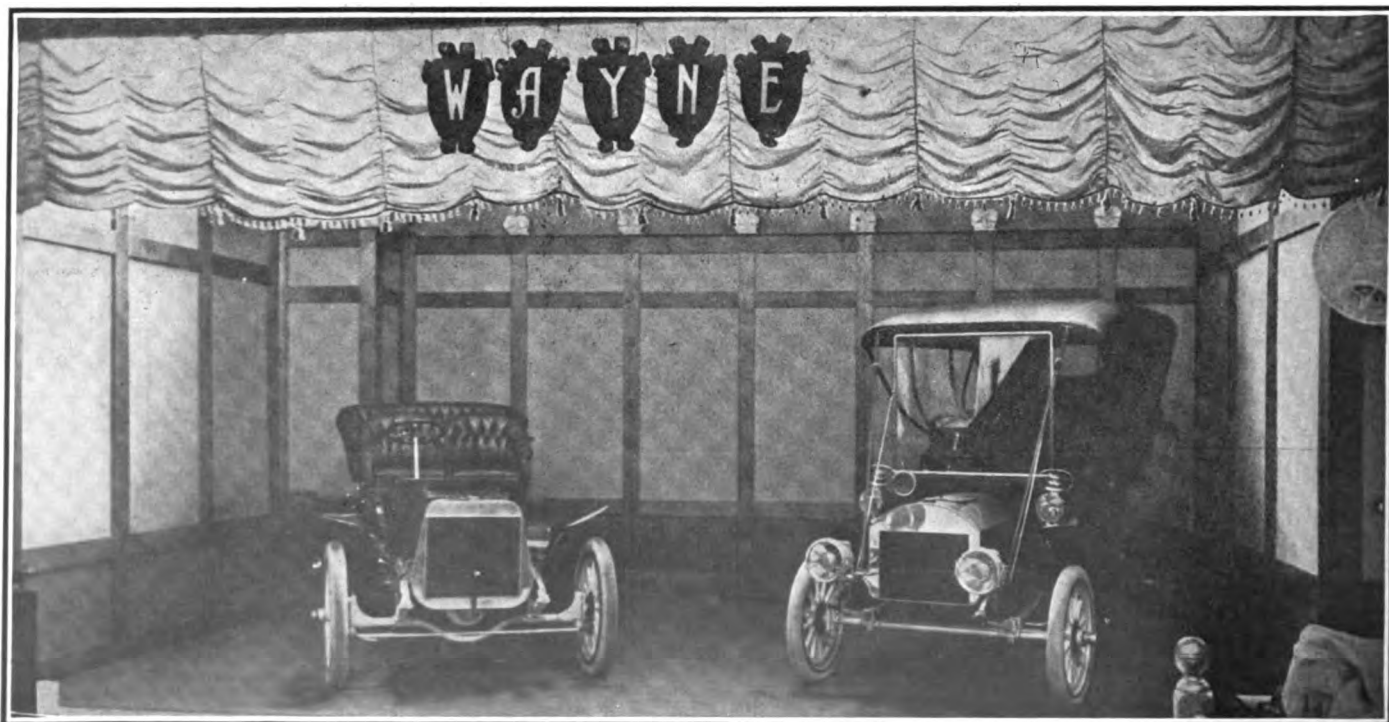
The exhibits of accessories and components are of considerable extent and include many of the best known houses in America engaged in the production of raw material and finished parts and fittings.

Exhibits in the First Regiment Armory.

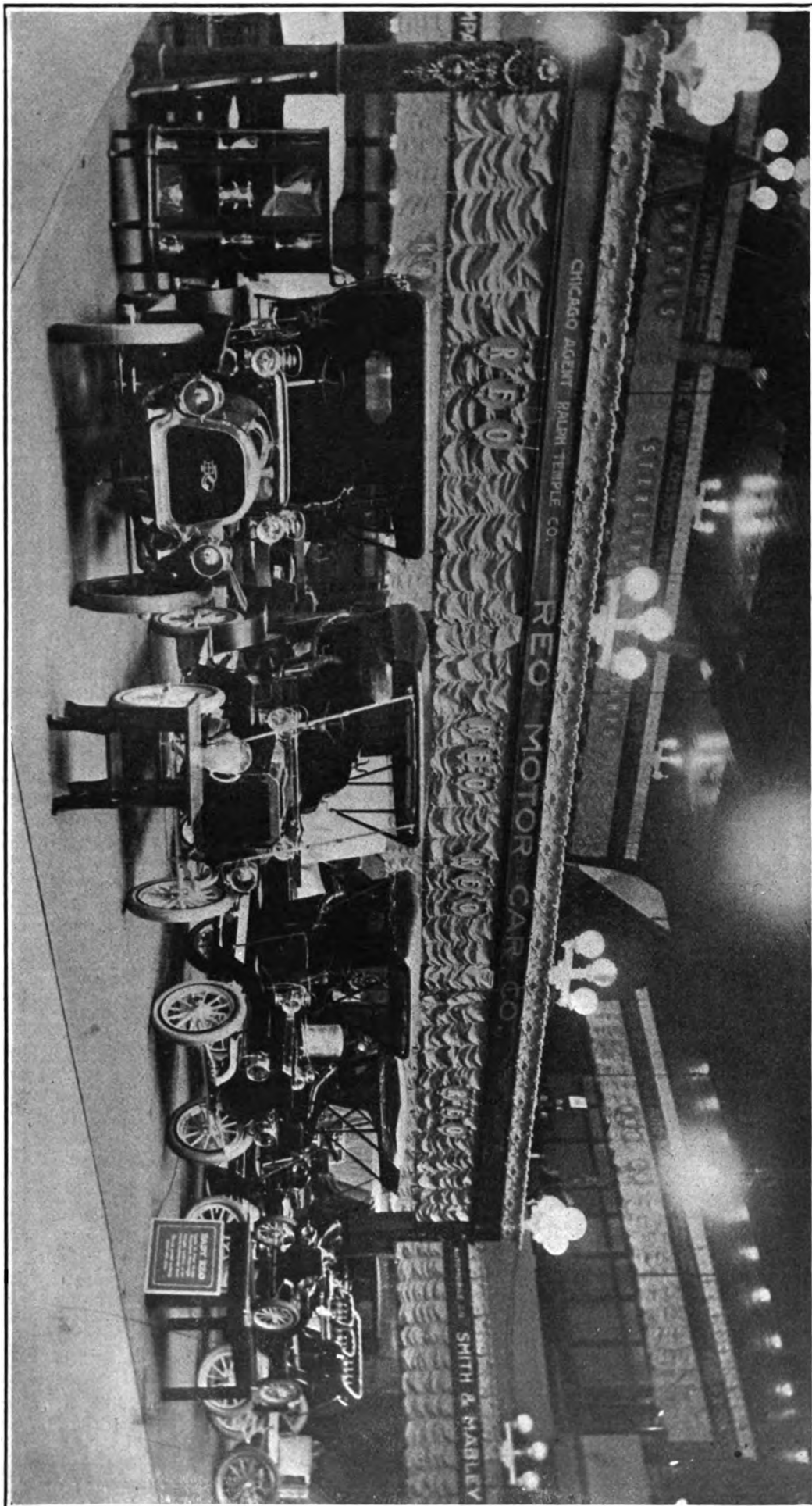
WHEN the First Regiment Armory was opened to the public at 2 o'clock Saturday afternoon, the exhibits were nearly all in place on the main floor, all the debris of unpacking had been removed and the huge hall looked as fresh and orderly and clean as if there had been time to spare for arranging exhibits and cleaning house. And yet a view of the Armory two hours earlier revealed a confused mass of cars, chassis, crates and boxes, heaps of packing, cars being hurried hither and thither, the floor coverings hidden by debris, and outside an apparently interminable line of cars in the street, some on their own wheels but

more of them ignobly carried on horse-drawn trucks, all awaiting their turn to be pushed into their places.

How the transformation was wrought it is impossible to say; but when the doors were thrown open and the band struck up, the visitor could only see broad aisles bordered by crimson carpeting, roomy exhibition spaces filled with shining cars and carpeted with green; columns surmounted by staff decorations in green and carrying huge white globes of electric light; and everywhere a restful harmony that was a strong contrast to the hubbub and confusion of an hour or two earlier. Only the rattle of ham-



ONE OF THE ALCOVE STANDS (WAYNE EXHIBIT) UNDER GALLERY IN COLISEUM—NOTE PANELING OF WALL IN BLACK WOOD AND BURLAP.



STAND OF THE REO MOTOR CAR COMPANY ON THE MAIN AISLE OF THE FIRST REGIMENT ARMORY, SHOWING SCHEME OF DECORATION.

mers, retreating before the visitors, and an occasional vacant space on the main floor remained to indicate that everything had not yet been done. A number of cars were delayed in transit and, not having arrived before the opening hour, were not in place; a few arrived during the afternoon, but were not allowed to enter while the show was open to the public. On the whole, however, the show was in a remarkably complete condition for the first day.

The exhibits of parts and accessories in the gallery were, generally speaking, in a backward state, but the Saturday afternoon crowd seemed to be looking only at complete cars, so the condition of the gallery mattered little and the hammer and broom continued their work undisturbed.

There was plenty of room for the cars shown at the Armory, the conditions in this respect being much the same as at the New York automobile shows; there was little or no crowding of cars and exhibitors seemed to be well pleased with their spaces. A feature of the main floor of the Armory is that there are no undesirable or out-of-the-way spaces; every space faces directly on an aisle, and nothing is hidden or obscured.

Perhaps the first feature to catch the attention of a visitor was the number of cars equipped with inclosed bodies. In this respect the show was like the New York shows. A majority of the spaces contained inclosed cars of some sort, and many exhibited cars with folding tops raised, adding to the impression that there were a great many bad-weather cars shown. A majority of the exhibitors also showed chassis, some being given a special exhibition finish.

Foreign manufacturers were well represented, no less than seven stands were devoted to cars built abroad, while at two stands were shown American replicas of foreign machines. The latter were the American Berliet, built by the American Locomotive Motor Car Co., which showed a chassis, a touring car and a limousine; and the Daimler Mfg. Co., of Steinway, Long Island, which exhibited an American Mercedes chassis. Both these exhibits were, like a majority of the exhibits in the Armory, brought from New York, where they were exhibited at the shows.

The exhibits of foreign cars included the English Daimler, a chassis being shown and also a complete car with touring body finished in gray; the Clément-Bayard, represented by a 24-horsepower chassis, a 60-horsepower chassis and a very handsome limousine with interior upholstered in gray cloth, exhibited by H. Sargent Michaels Co., of Chicago; a Panhard 24-32-horsepower limousine, a 20-horsepower Renault touring car and a 20-horsepower Delaunay-Belleville chassis, highly finished, shown by the Palais de l'Automobile, of New York; a Panhard 40-50-horsepower chassis and a limousine of the same rating exhibited by the Ralph Temple Automobile Co., of Chicago, the limousine being finished in black;

two Renault cars, a chassis and a "town car," the former of 20-25 horsepower and the latter of 10-14 horsepower, shown by the Automobile Importing Co., of Chicago, the inclosed town car in particular being much admired; a Renault inclosed car apparently of the 10-14-horsepower type was seen at the stand of Smith & Mabley, of New York, where a Smith & Mabley Simplex chassis and complete car were also shown; and a de Leon large touring car, finished throughout in red, and an exhibition Hotchkiss chassis of 40-45-horsepower, the latter in particular being a center of attraction, shown by Archer & Co., of New York. All these cars were shown in New York.

There were very few exhibits that had not been exhibited at the New York shows and described in the New York show numbers of THE AUTOMOBILE. At an even half dozen stands there were complete cars that were not shown in New York, and exactly two-thirds of these were commercial cars. Among the pleasure cars a new machine which promises to be of technical interest was equipped with a four-cylinder four-cycle motor which, owing to the absence of the usual valve operating mechanism and to the peculiar arrangement of the piping, looked as though it was a two-cycle motor. Inquiry elicited the fact that the motor operates on the four-cycle principle, but instead of the usual valves there are sliding liners in the cylinders which alternately uncover and cover ports in the cylinder walls. The complete car and separate engine which formed the exhibit were only finished the day before the show opened and were not brought into the Armory until the evening. In the rush and confusion incident to getting the exhibits unpacked and set up it was possible to obtain only a few general facts, and a more detailed description will therefore be given in a future issue. The car and engine were shown by the Knight & Kilbourne Co., of Chicago, and, on account of the extreme quietness of its operation, the machine has been called the "Silent Knight."

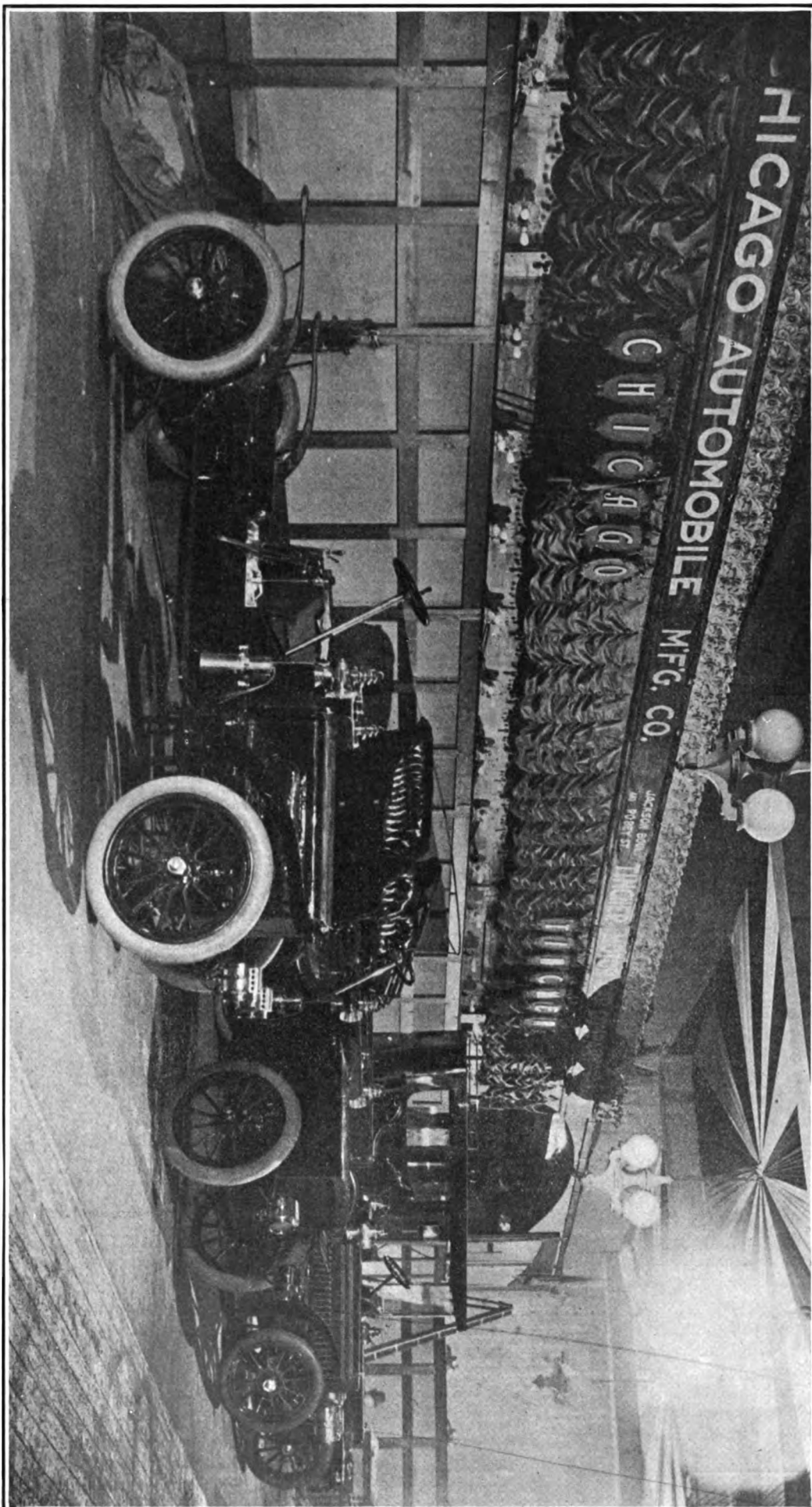
No little attention was attracted by the exhibit of cars equipped with air-cooled motors whose cylinders rotated around a stationary vertical crankshaft. These machines, manufactured by the Adams Co., of Dubuque, Ia., embody a number of novel features, most of which are more or less familiar to readers of THE AUTOMOBILE. The motor is placed over the rear axle under the rear seat and the rear fitted to the touring car of this make is built as a storage place, having the capacity of a good-sized trunk. Two interesting broughams are exhibited of the same type and possessing the same mechanical features, but differing slightly in size. The peculiarity of this car is that it can be driven from the inside or from the outside, as may be desired; when being driven from the outside there is nothing to show that it can be driven from the inside, and *vice versa*. The front or

outside seat is so arranged that the footboard can be folded over it, the car then looking as if equipped with a permanent down-curved front. Before folding up the dash the steering column, brake lever and pedals are removed from the sockets in which they fit in the footboard and are placed in similar sockets in the floor inside the car. A complete set of controlling levers is available for either inside or outside use. With the front seat open and an extra interior seat in use the larger brougham will seat seven persons; the smaller one seats five. In addition to the broughams and the touring car, a runabout was shown. This machine could be arranged for either two or four passengers by the use of a folding seat. The runabout was fitted with a three-cylinder engine rated at 20-25 horsepower, while the larger cars have five cylinders and are rated at 40-45 horsepower. The larger engine is a new one, though built exactly on the same principle as the older model.

The remaining four new exhibits, all commercial cars, are all examples of different types of construction. The Soules commercial car, of the medium weight class, driven by a double-opposed cylinder motor, will be described and illustrated in a later issue of THE AUTOMOBILE, and needs no extended reference here. Three cars were shown, one a delivery wagon with box body, top and wire screen sides, one an open box body express wagon with top and side curtains, and there was also exhibited a chassis showing the motor and other working parts exposed. The manufacturer stated that twenty-five of these cars had recently been sold on one order. In the heavy electric class the only representative was a huge five-ton truck shown by the Synnestevedt Machine Co., of Chicago. This machine was fitted with a very large platform for carrying bulky loads, and was easily the largest vehicle in the Armory. A placard attached indicated that the truck had been sold to Marshall Field & Co., of Chicago.

In the heavy gasoline truck class there were two machines, representing two different designs. The Kansas City Motor Car Co. showed a four-ton truck with a four-cylinder horizontal motor with opposed cylinders, rated at 60 horsepower, and the American Motor Truck Co., of Lockport, N. Y., showed a truck of the same capacity with a four-cylinder vertical motor rated at 36-40 horsepower. In both cases a number of interesting, and in some cases novel, details are involved, descriptions of which must, however, be reserved for a future issue.

Connections for electric power for showing machinery in motion were not made the first day, and the friction drive chassis of the Buckeye Mfg. Co., of Anderson, Ind., and other machines intended to be shown in operation were at a standstill, though the Lambert friction drive attracted the usual attention. The Reo "Baby" was always the center of a crowd, and the Reo Motor Car Co., of Lansing, Mich., had its space, one



ABLE STANDS IN THE COLISEUM ANNEX ON THE MAIN FLOOR—CHICAGO STEAMER AND TITCHER GASOLINE CARS IN FOREGROUND AND CENTER ARE CHICAGO PRODUCTS NOT SHOWN AT THE NEW YORK AUTOMOBILE SHOWS.

Auspicious Opening of Washington Show.

of the largest in the Armory, constantly filled with visitors. The Reo exhibit was the same in New York as in Chicago; in fact, with the exceptions that have been mentioned, the exhibits were practically identical with those shown in the East. The beautifully finished Prager-Miller chassis and the handsome chassis of the Cleveland Motor Car Co., as well as the exhibits of the Rainier Co., of New York; the Berkshire Automobile Co., of Pittsfield, Mass.; the Dayton Motor Vehicle Co., of Dayton, O.; the Western Tool Works, of Galesburg, Ill., showing the Gale cars; the Moline Automobile Co., of East Moline, Ill.; the Lozier Motor Co., of New York; the Rapid Motor Vehicle Co., of Pontiac, Mich.; the Acme Motor Car Co., of Reading, Pa.; the Marion Motor Co., of Indianapolis; the Logan Construction Co., of Chillicothe, O., and the Moon Motor Car Co., of St. Louis, were all transferred bodily to Chicago, though in a few cases the exhibits had to be cut down, as in the case of a firm showing several types of pleasure cars and also commercial vehicles, there not being space for all of both. Among the exhibits that failed to arrive in time for the opening were those of the C. H. Blomstrom Motor Co., of Detroit, makers of the Queen cars, and John L. Dolson & Sons, of Charlotte, Mich.

An exhibit that attracted the attention of many of the fair sex was that of the Buffalo Electric Carriage Co., of Buffalo, N. Y., which showed a variety of small electric vehicles for pleasure purposes. The small electric commercial vehicle was represented by a delivery wagon shown by the McCrea Motor Truck Co., of Cleveland, a description of which is necessarily reserved.

The exhibit of parts and accessories was so incomplete that even a summary cannot be given at present. Judging by appearances, however, the exhibit will be an excellent one.

Taken as a whole, the Armory section of the Chicago show is remarkable for the wide variety of cars exhibited, each class being well represented by typical examples. The finest type of foreign car is there, as well as the American-made foreign machine; the American car, in all grades and all forms, is there; the electric car is much in evidence; gasoline motors are seen in all forms, both air-cooled and water-cooled; commercial machines, electric and gasoline, range from the largest the Armory doors would pass to the light delivery wagon; and so the list might be continued indefinitely. Thus, while there is perhaps less novelty than might have been expected, there is such a variety that the visitor's interest is attracted and held. The prospects for an exceedingly successful show are, apparently, excellent, and it is to be hoped that the Armory section of the show will not be overlooked by visitors on account of the greater size, though hardly greater interest, of the main exhibition in the Coliseum.

The Cuban government has waived all duty on touring cars for six months.

WASHINGTON, D. C., Feb. 5.—Beautified with bright-colored decorations and thousands of electric lamps, and with admiring throngs filling the aisles around the various stands, where automobiles and accessories of almost every type were to be seen, the interior of the Washington Light Infantry Armory presented a brilliant and animated scene on the opening to-night of the sixth show to be given by the Washington Automobile Dealers' Association.

With only two days in which to prepare exhibits before the evening of the opening, things were in a much more completed state than would be thought possible when it is considered that so many of the exhibits required complicated wiring. At the opening to-night several thousand persons were present, many by invitation of the dealers' association. They thronged the aisles, and the general opinion expressed on all sides was that the show was going to be a big success. The weather conditions are good and this will bring out the "good weather" people.

The collection of cars is the finest ever seen in Washington, a number being shown here for the first time. Among them are the Lambert, Auburn, Dolson, Jackson, Pierce Arrow, De Mar, Yale, Premier, Logan, and Reo. Agencies for these cars have been placed with Washington dealers, many of them since the New York shows.

While the local show is naturally attracting hundreds who have little intention of purchasing automobiles, many will get the automobile fever, and will fall in line with others and be in the great army of automobile users. It was noticeable to-night that many substantial business men of the city were manifesting the greatest interest in the automobiles displayed, and there was not a single exhibitor who did not secure a good list of "prospects." Many persons in official and social circles dropped into the show to get a glimpse of the 1906 models and, becoming interested in the many new things, stayed throughout the evening. In a word, it was the most representative crowd that has ever attended a local show and every exhibitor is wearing "the smile that won't come off." For a local show, the Washington exhibition is brilliant, and indicates at the start that it will draw the public better than any previous show.

After having examined all the exhibits, listened to the discourses of the various expositors, and noted the great advances made in automobile building since the last show, many visitors found a pleasing diversion by entering one of the company rooms to the right of the main door, where the Automobile Club of Washington has its headquarters during show week, and where it is dispensing hospitality of the substan-

tial kind. The room has been decorated in pleasing style, with plenty of easy chairs, and proved one of the most popular features of the show.

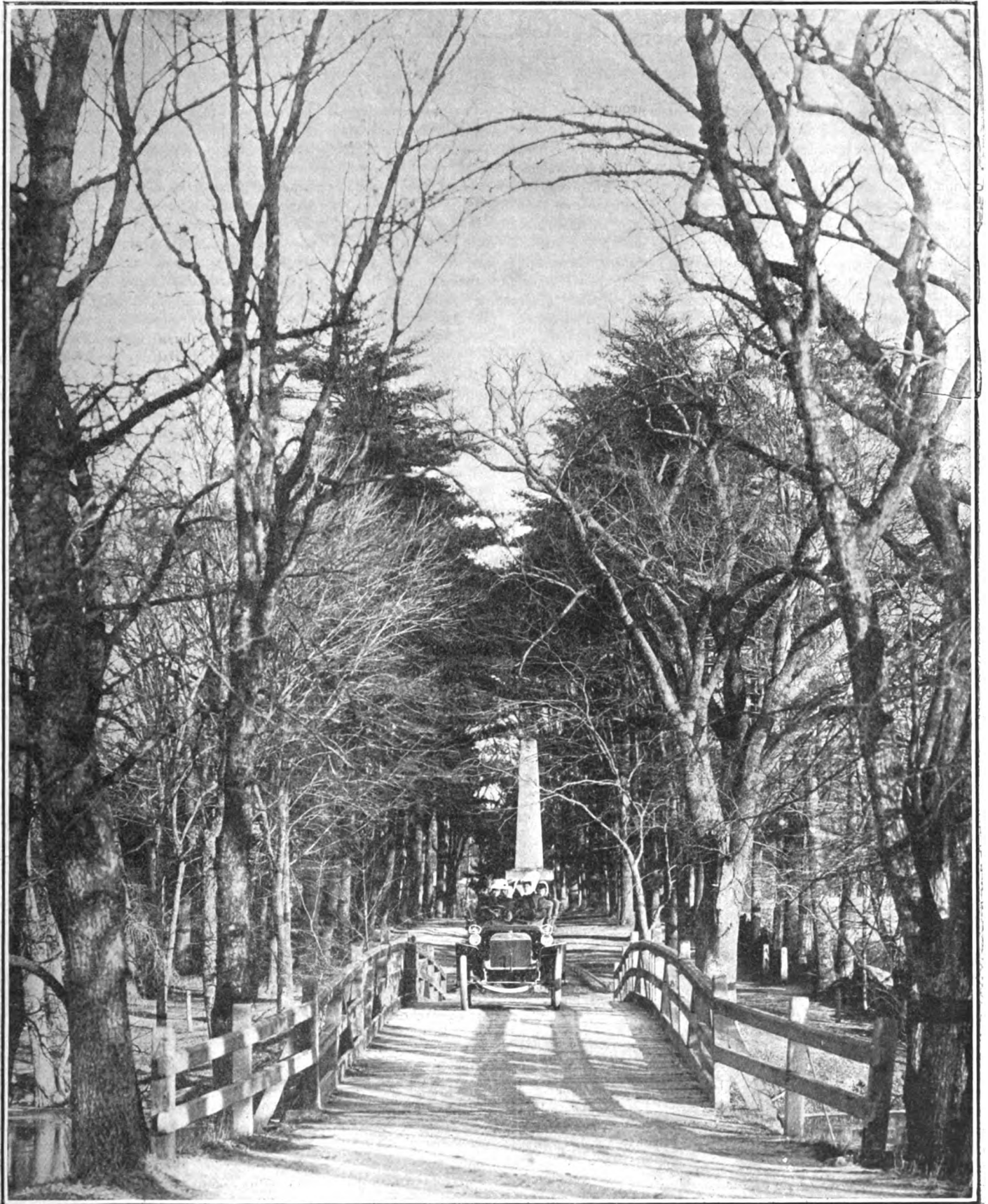
The full list of exhibitors is as follows, all being of Washington unless otherwise stated:

Pope Mfg. Co., the full Pope line of cars and sundries; Cook & Stoddard Co., Locomobile, White, Franklin, Cadillac, Baker; Washington Electric Vehicle & Transportation Co., Columbia gasoline and electric vehicles; Haughton Automobile Co., Yale and Premier; S. J. Meeks' Sons, Lambert; Willard Automobile Co., Jackson and Dolson, Swinehart tires; H. A. Rhine & Co., Haynes and Auburn; Thomas & Helbert, Maxwell; Commercial Automobile & Supply Co., Wayne and Logan gasoline and De Mar electric vehicles; Reo Motor Car Agency, Reo; National Automobile Co., Thomas, Packard, Buick, Studebaker, and Oldsmobile; Motor Car Co., Baltimore, Md., Peerless and Stevens-Duryea; Chas. E. Miller & Bro., Ford, Columbus electrics, and Indian motorcycle; Southern Automobile Co., Baltimore, Pierce Arrow; Electric Storage Battery Co., Philadelphia, Exide batteries; National Electric Supply Co., Michelin, Samson, and Harburg tires. Solar and Rushmore lamps, Gabriel horns, Foster shock absorbers, and tops of the Auto Top & Cover Mfg. Co.; Rose Mfg. Co., Philadelphia, Neverout lamps; Rudolph, West & Co., sundries; Wm. C. Robinson & Co., Baltimore, lubricants; Voorhees Rubber Mfg. Co., Jersey City, N. J., Voorhees tires; Detroit Motor Works, Detroit, marine engines; Automobile Tire & Repair Co., Hercules tires; Truscott Mfg. Co., motor boats and engines.

READY FOR PHILADELPHIA SHOW.

PHILADELPHIA, Feb. 5.—Making no claims to "the greatest show on earth," the automobile exhibition, which will open in the Export Exposition Building, this city, two weeks from next Saturday, will in every way be worthy of this city. Despite the 100 per cent. increase in space over last year, Manager Chester I. Campbell has been compelled to turn away a number of would-be exhibitors. A few of the late ones were taken care of in corridors, passageways and odd corners, but those who had cars to display were of necessity forced to go away disappointed.

Arrangements for the show are well in hand, the music, decorations, programmes and lighting being in the hands of committees which have practically completed the details of their several duties. The decorators and electricians only await the turning over of the building on the Monday preceding the show, to get to work, and it is the intention of Manager Campbell to have a complete exhibition ready for the first visitor on opening night.



A REVOLUTIONARY RELIC.

CROSSING THE CONCORD (MASS.) RIVER IN A WINTON AFTER A VISIT TO THE MONUMENT MARKING THE BRITISH POSITION IN THE FIRST BATTLE OF THE WAR OF THE REVOLUTION. POSTS AT RIGHT NEAR FENCE MARK BRITISH GRAVES.

A DISCUSSION OF THE 1906 CHASSIS.

By FORREST R. JONES, M.E.

ONE of the greatest achievements of engineering skill is the production of the automobile chassis. Materials of the greatest strength and durability are combined in forms that give extreme lightness and the utmost rigidity of construction, while presenting beautiful outlines pleasing to the eye. And over all its motions there is such perfect control that it seems almost a thing of life when promptly responding to the touch of a skillful driver. Yet without its almost discarded forerunner, the bicycle, no such rapid development could have been possible, for the successful efforts to secure extreme lightness united with great strength in the pedal-driven machine, brought forth materials and structural forms far in advance of anything before produced. Not the least of these is the pneumatic tire, without which little attention would have been given the bicycle, and which makes high speed so comfortable and free from jar or shock in the heavier machine.

The two recent exhibitions of automobiles in New York City showed considerable tendency toward uniformity of chassis construction in pleasure cars, especially of the larger sizes. There can hardly be said to be much approach to uniformity in small cars of the runabout type or light tonneaus with one or two cylinder engines. One is strongly impressed with the increasing predominance of internal combustion motors.

In freight trucks and delivery wagons no uniformity has yet been approached, although no greater diversity of lines has been shown than in pleasure vehicles. The motor is more often placed under the body of the truck, however, than in the latter, and motors similar to those for pleasure vehicles are used. The tendency, however, is to bring the motor back nearer to the rear axle, which it drives, in freight than in pleasure cars.

One of the greatest steps in automobile practice has been the production of a low-priced gasoline car with four cylinders, the design of which shows the greatest ability and thought on the part of the designer in eliminating all unnecessary parts, combining and simplifying those necessary, and putting them together in a substantial manner so as to make the machinery easily accessible, and to permit removal of parts necessary to give access to those that are encased, without disturbing adjustments requiring some time to make. If the materials and workmanship on such a car prove as serviceable as the design is excellent, it will be a powerful factor toward producing important changes in automobile practice.

The ultimate form of pleasure automobiles will be such that examinations, adjustments and repairs to the motor and power

transmission parts can be made from the sides and above. There should be no need for pits and elevated tracks in the repair shop and garage, except for working on the body and frame when putting them together, or separating, or work of a similar nature.

In treating the chassis it becomes necessary to separate pleasure cars into two classes, those which are large and driven by four-cylinder engines placed in front, and the smaller cars, with one or two cylinders of the runabout or light tonneau type.

LARGE PLEASURE CARS.

Beginning with the frame of large pleasure cars, it may be noted that the pressed steel channel is almost universally employed without reinforcement. Few cars have a channel reinforced by wood, while one frame is made of wood entirely except the fastenings. Wood reinforced by steel, and armored wood appear in isolated cases. In the majority of frames the sides are straight as are the end members, and the four pieces together form a rectangle.

The tendency is toward elimination of the narrowed or contracted front end of the frame. Many builders, however, have retained the contracted front, and in isolated cases there is a gradual tapering toward the rear, and sometimes elevation of a short portion of the rear.

The sub-frame for carrying the engine and transmission has become less frequent than heretofore. The more common practice is to support the engine directly on the side members of the frame and the transmission on crossbars also running from side to side, or to place the forward end of the engine on long struts across the front angles of the frame, supporting the other parts as mentioned. One machine presents the unusual method of supporting the engine by a steel apron, which is trough shaped with flat bottom and straight, sloping sides, the sheet metal being thick enough to form a rigid support for both engine and transmission. The apron is attached to the side members of the frame and holds it rigid to resist deformation at the front angles; short braces are used in the rear angles. While the steel apron has been adopted in several cars, this appears the only one in which it is used alone as the support of the engine. In other cars the engine and transmission are supported upon cross members in the form of I-beams, channels or angles, and the apron serves only for protection against foreign matter.

Practically all the frames of heavy machines are supported at four points over the axles. There is one notable exception to this, however, where a compound frame is used, consisting of the regular rectangular super-frame, and in addition a triangular sub-frame, shaped much like the letter V,

but with the top closed by a straight member. The sharp angle of the frame is supported at the bevel gear drive of the rear axle and swivels about the propeller shaft bearing. The two longer sides of the angle extend from the gear drive to the springs on the front axle upon which they rest, and the short member extends across the front of the car, with a support for the forward part of the rectangular frame at the center of its width, the connection allowing free motion of the parts relative to each other. The lifting of either front wheel by an obstruction or its depression by dropping into a hole in the road leaves the frame standing as level as if the forward wheels were on a level roadway, and does not introduce any strain in the frame, at the same time allowing each spring to carry its correct proportion of the load. When one of the rear wheels is elevated or depressed, the body is tipped accordingly, but the condition of freedom from strain in the frame continues the same as when tipping the front axle. One who has ridden over our country roads and has seen his car run on three wheels at times, and has suffered broken springs in consequence will appreciate this or any other construction which allows flexibility to meet uneven surfaces and chuck holes. The common practice of supporting the frame by four points over the wheels makes a car very satisfactory for city streets and good roads as well as one which does not tip so readily on rounding curves rapidly and is generally satisfactory, but is not best for the poor roads which predominate so completely in the rural districts of our country. The conditions are similar to English and American practice in railway locomotives. The rigid frame of the former is entirely suitable for the excellent roadbeds of England, but would not answer for our more uneven tracks. Hence the more flexible American locomotive with its system of equalizing levers.

Springs, with few exceptions, are semi-elliptical both front and rear. Full elliptical springs are used to some extent in the rear as well as platform springs, and the three-quarter elliptical still remains on a few cars, chiefly in the rear. The provision for lubricating the pins of springs shows a commendable attention to the small details toward making a car comfortable, quiet and durable.

There is a tendency toward more rigid construction in the parts which form the supporting connection between the engine and sliding change speed transmission gears, thus eliminating the necessity of a coupling of great flexibility between the two. A completely rigid support for engine and transmission is a desirable feature in connection with the elimination of any flexible coupling.

Axles are generally of forged steel or cast bronze. The I-section predominates for dead axles. It has been almost universally adopted for the front and dead rear axles. One car uses a tubular axle reinforced by a strip of steel placed vertically inside and setting against the top and bottom of the tube. (Fig. 1.) With the live or floating rear axle the hollow section is necessary of course, and the circular form is common.

A castor type of swivel for the steering knuckle has received most favor by designers. Tilting the tops of the front wheels away from each other so as to bring the bottom more nearly under the swivel of the steering knuckle is followed to a large extent, and this construction serves to make steering easier and relieve the swivel pins of bending stresses in proportion to the

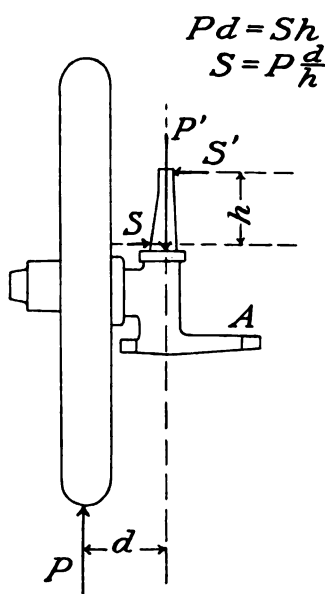


FIG. 2.

amount that the bottom of the wheel is brought in. Roller or ball bearings at the bottom carry vertical thrust of an amount equal to the load carried on each wheel when the swivel pin is vertical. The top of the castor pin is usually supported by a plain bearing only, since it resists only a comparatively small amount of side pressure, although ball bearings are sometimes found here. Ball bearings are used commonly in the front wheels, and roller bearings on the rear live axle. When the latter is dead, as is the case with double chain drive, ball and roller bearings seem to have about equal preference for the rear wheels. The latter conditions also exist for the floating axle drive when the wheel is supported on the dead tubing which is the rear axle, and surrounds the floating drive. Cone roller bearings have found considerable application for wheels.

EFFECT OF TILTING FRONT WHEELS.

The effect of inclining the front wheel so that the bottom is brought nearer to the middle line of the car, as shown in the greater ease of steering thus secured, can be understood by reference to the sketches—Fig. 2

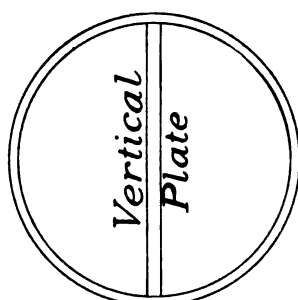


FIG. 1.

shows the wheel vertical and Fig. 3 the wheel inclined, the axis of the knuckle swivel remaining vertical in both cases. When the wheel is vertical, the distance measured horizontally between the point at which the swivel axis if extended would touch the ground, and the center of the area of contact of the tire with the ground is the distance d measured in a direction parallel to the front axle.

When swinging the wheel and knuckle around as is done for turning a corner, the resistance is the friction due to the pressure of the swivel against its bearing. The friction of both swivels must, of course, be overcome in turning the knuckle. The friction of the knuckle is proportional to the pressure upon it, or at least very nearly so. The weight resting on the knuckle is of course equal to the pressure of the rod against the wheel. The latter is indicated by P and the downward pressure on the knuckle by P' . According to the statement already made, $P = P'$. The side pressures against the swivel are two equal forces, S and S' . Of these S acts horizontally against the lower cylindrical surface of the swivel pin, pressing against the side next the wheel, and S' acts horizontally also, but at the top cylindrical surface of the pin and in the opposite direction. The value of S can be found by equation $Pd = Sh$ from which $S = Pd/h$.

By inclining the wheel, the intensity of the side pressures on the pin is reduced. In Fig. 3 the inclination has been such as to make the distance between the axis of the swivel pin and the line of pressure upward against the wheel one-half as great as before. It is shown as $\frac{d}{2}$. The smaller side pressures are indicated by $s = s'$, and in the same manner as before, the value of s is found to be $s = Pd/2h$; that is, the horizontal force is one-half as great as when the wheel was vertical. The pressure downward on the knuckle joint remains the same as in the preceding case, still being $P = P'$. The reduction of friction in the knuckle swivel is therefore due only to the lessened side pressure on the pin.

FOUR-CYLINDER MOTOR PREDOMINATES.

The four-cylinder engine largely predominates, the six-cylinder appearing to but a small extent. The tendency is more toward units of one cylinder, twin cylinders apparently not being in so much favor. From the viewpoint of the owner, the one-cylinder unit is more desirable on account of less

expense for repairs in case of a damaged cylinder, and in general greater ease of removing the cylinders. While the completely closed cylinder head, except openings for ports and ignition plug, is desirable from the point of view of the user, yet many constructors have found it best to make an opening in the center of the head large enough for a boring bar to be used in machining the bore of the cylinder, or for grinding or lapping the bore. With carefully fitted steel plugs the danger of leakage about the plug is probably not great enough to require serious consideration. This is not true of cast-iron plugs.

In the water-cooled engines the majority have inlet and exhaust valves on opposite sides of the cylinder, and two camshafts are used when all valves are mechanically operated, as is the rule in the four-cylinder type of engine. A large number of machines have all valves on the same side of the cylinder, however, thus using only one camshaft. In unusual cases automatic inlet valves provide the means of having the inlet and exhaust on opposite sides of the cylinder with only one camshaft, but the more common construction is to place the automatic inlet immediately over the exhaust. In the water-cooled machines, which largely predominate, the camshafts are nearly always placed in the bed of the motor, and the valves are lifted by a direct vertical thrust of the cam followers pressing against the valve stem.

AIR-COOLED MOTOR VALVES.

In the air-cooled machines the valves are almost invariably placed at the top of the cylinder either with the stems vertical or inclined away from each other at the top. Great diversity is shown in operating the valves, although the mechanical method is practically the only one used on air-cooled motors. The necessity of introducing a rocking beam when the camshaft is in the bed of the engine, or of making the cam act by pressing its follower downward, the latter having a finger which extends out to

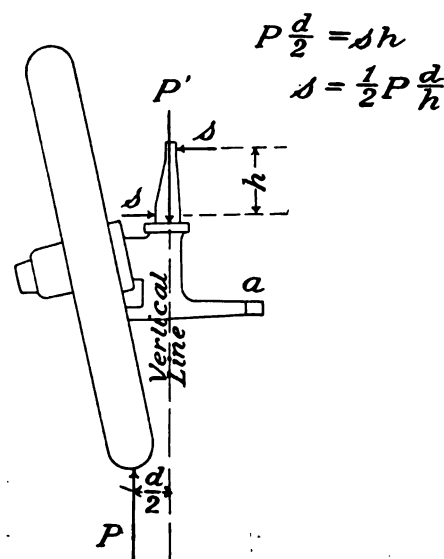


FIG. 3.

press down the valve stem, has, on account of the complicity of parts in rapid motion, induced some designers to run the camshaft above the cylinder heads parallel to the crankshaft, and operate both the inlet and exhaust valves from it, using a vertical shaft with bevel gear drive at both top and bottom for transmitting power from crankshaft to camshaft. One air-cooled engine rotates the cylinder about a stationary transverse shaft, the drive being from parts attached to the rotating cylinders.

The tendency toward more universal adoption of removable valve seats that can be taken out together with the valve so that worn parts may be easily reground or renewed, and the use of yokes for holding the removable parts in place, including valve boxes and inlet and exhaust pipes, is increasing. The use of yokes instead of the older method of several bolts or studs and nuts for attaching such parts is a great improvement. By the older method it was more difficult to get a good joint, and the time for attaching and removing was much greater. Sprung flanges and leaky joints, especially on the exhaust, were not uncommon. While many yokes use but one bolt, several extend over two parts and have two or three bolts.

Cast iron is nearly always used for the cylinder and piston. The stroke in the majority of cases is a little longer than the diameter of the cylinder bore, but variations are found from 15 per cent. larger bore than stroke, to 15 per cent., or even 20 per cent. longer stroke than diameter of bore.

CRANKSHAFT CONSTRUCTION.

The crankshaft is quite generally supported on ball bearings, most cars having three, but several using five supports for the shaft. Ball bearings are also used on the crank end of the connecting rod. The plain cylindrical bearing is also much used; in fact, several machines have plain bearings throughout the entire engine. While ball bearings unquestionably reduce the frictional resistance when starting from rest and at slow speeds, there is a question as to whether they have less friction than plain journal bearings when running at high speeds and well lubricated, as by the splash method with suitable oil holes and grooves, or by ring oiling.

When the space available for the length of crankshaft is small, ball bearings have the advantage over plain journals of occupying less length of shaft. The selection of them may sometimes depend on this property.

The material of the crankshaft is naturally of the best quality. In high-priced cars nickel steel is in common use. In the best practice the crankshaft is machined out of the solid slab. The materials for plain bearings on the crankshaft have gone through the same steps as in stationary engine practice. In the latter Babbitt metal was used in the earlier types and then discarded for bronze, but taken up again later. Many of the best cars now use Babbitt-

lined bronze bearings. A good Babbitt alloy has a lower coefficient of friction than bronze, this property insuring a reduction of frictional losses in the motor, and also has good wearing qualities. It is probable that the Babbitted box will remain.

Accessibility to the crankcase by the removal of a comparatively small hand plate has been given more attention than heretofore, and the suspension of the crank from the upper part of the bed is growing more common.

One four-cylinder machine has adopted an excellent arrangement for entire accessibility to the crank, cylinders and piston by dividing the crankcase vertically through the middle, and arranging the crankshaft supports so that when half the case is removed the shaft is supported by a single bearing. Upon removal of the latter the connecting rod and piston can be taken out without disturbing the cylinders or the pipes connected to them.

MATERIALS USED FOR CLUTCHES.

Metallic clutches are gaining in favor both in the multiple disk and the expansion types. This is following the lines of development in other classes of machinery long since worked out. As a comparison of the evolution of the friction clutch, it is notable that in electric traveling cranes the multiple disk and expansion clutches are the ones which have proven more satisfactory, the leather-faced cone clutch having been quite generally discarded. One of the chief objections to the leather is its tendency to seize suddenly and bring undue strains and jerks on the machinery, and, as it grows old, to become glazed or oil soaked, both of which cause slipping, and necessitate unduly high pressure between the friction surfaces. There is a more general application of flat springs under the leather for forcing it into more gradual contact with the mating part. Radial acting plungers forced out by coiled springs are also more common for the same purpose.

The materials of the rubbing surfaces in multiple-disk clutches vary. Steel on steel is often used, and less frequently bronze on steel. The materials in expansion clutches are usually different, bronze on steel or on cast iron being common. Ample means of lubrication are provided, one being the oil bath. The film of oil that gets between the surfaces when the clutch is released serves as a cushion, which is gradually squeezed out when closing it, and allows gradual starting. This is best secured by the use of numerous oil grooves in the friction surfaces. From ten to thirty disks, 6 inches or slightly more in diameter, are used.

An interesting way of illustrating the great turning effort that can be transmitted through a multiple-disk clutch of comparatively small diameter closed by a light pressure is that of taking two visiting cards or strips of paper and laying one partly over the other, with a paper weight on top, and then pulling them apart horizontally, noting the pull necessary to slide them over each

other. Then take a dozen or more similar cards and pile them up with the ends overlapping about half their length, placing the same weight on top of the pile and pulling them apart as before. The force required will be surprisingly greater than for the two cards. The necessary pull is in proportion to the number of pairs of rubbing surfaces in contact.

SELECTIVE SLIDING GEARS.

Selective sliding change-speed gears are growing in favor with manufacturers, several having changed from the step-by-step type to the selective, while those that heretofore used selective levers still retain them. Planetary gears are, by the very nature of their construction, also selective. One car with sliding gears is equipped with a ratchet in the back gear, which meshes with its mate on the propeller shaft in order that change may be made from direct drive to slower speed quickly and without releasing the clutch. Change-speed gears are made larger and more powerful with a more general use of chrome nickel steel in their construction for securing both strength, toughness and hardness, all requisites for the service they must perform.

The square shaft for the sliding gears is still in much evidence, although some makers use a shaft with four feathers machined from the solid, thus securing ease of sliding and ample strength.

The direct-drive positive clutch which has been made with two or three large jaws on each member to a considerable extent has been replaced more completely by the type in which a spur gear fits into a corresponding internal gear, the latter type giving greater ease of throwing the parts into engagement, and removes the tendency for the jaws to hammer against each other.

(To be continued.)

COLLEGE WANTS AN AUTO.

CHAMPAIGN, ILL., Feb. 5.—The Illinois Agricultural College may make use of the automobile for a novel purpose. It is now planned to use several of them in making tours of the state in making soil investigations. Up to this time the college force has sampled the soil of nearly every county in the state. Heretofore teams have been used in traveling about during spring, summer and fall. It is believed that an automobile equipped with the paraphernalia required to take care of such a business may be run about the state to very great advantage, and that more work will be accomplished by the use of such a conveyance. At times forty men are required to attend to the experiments that are being made in different fields of the experiment station and those located in different sections of the state.

E. R. Thomas, well known in automobile racing circles, has ordered a White steam racing car, to be the largest ever built by the White company. It will probably be entered in the next Glidden tour.

TENDENCIES IN CAR DETAILS AT SALON.—II.

By RENE M. PETARD.

(Continued from page 86, issue of January 11.)

PARIS, FRANCE.—Having thus completed the study of the carriage part of the automobile at the recent Salon—that is of the simplest, but not least difficult part of the machine to design and manufacture soundly—we may now pass to the study of the active organisms which give the life and the power necessary to the propulsion of the motor car.

Beginning with the very source of all sorrows as well as of all pleasures, we shall first survey the motor in its various shapes, giving this omnipotent master of the car all the attention which his important functions entitle him to.

In France the horizontal motor is dead. Dying it was last year, passed away it is this year. Two European makers only exhibited it in the Serres annex, and even then what they showed were merely samples intended to rid them of the stock they had accumulated in older days. It is true to say that Cadillac and Oldsmobile who pluckily came to plant the Yankee flag amongst the proud Europeans also do show it, and not from old stock either, but it must be borne in mind that we do not take them into account here, this report concerning only the European built machines.

Inclined or V-placed cylinders are still to be seen in some bashful instances on runabouts, and in full glory on practically every motorcycle, but not on a single pleasure car, although Darracq may, perhaps, lead them to victory with the now famous 200-horsepower eight-cylinder sprint racing car, which is fitted with V engines, working

on four throws of the cranks—that is, two cylinders on each throw.

Aside from these few exceptions, probably intended to merely confirm the rule, the vertical cylinder stands boldly, undenied master of the situation. The universal adoption of this style of engine has in consequence caused the also almost universal adoption of the Mercedes type of hood, that is, the type with a vertical radiator in front and folding tops and sides to cover up the machinery. Three notable exceptions only are to be found on this point; they are the Renault, the C. G. V., and the De Dion, who keep their characteristic shapes of old, the two former at least, since the latter comes to the Mercedes type for the medium and the high-powered cars of his manufacture.

POSITION OF MOTOR.

Racing car construction shows its influence in the position of the motor on the frame. The engine is now generally brought very far back on the chassis, the radiator being usually placed no further forward than the vertical plane of the front axle, this giving all machines, even of low power, an appearance of speed and power which is now considered as one of the conditions of beauty for the automobile, while at the same time this fashion puts the machine in the very best conditions of steadiness on the road and of stability, as well as making the mechanisms under the hood more accessible.

This last mentioned item of accessibility

has apparently been one of the principal thoughts of the designers this year, and it has resulted, so far as the power-producing portion of the car is concerned, in increased simplicity; the time-honored array of rods, levers, castings, pipes, valves, and similar nuisances, as regards repairs, having gradually disappeared, or at least shifted away to some more convenient place.

As was mentioned before, the four-cylinder vertical motor now stands supreme. For any power above 12 horsepower, no other type of motor is so found, except in some cases where six-cylinder machines can be noticed. This is, however, not to be taken just now as an improvement bound to replace the four-cylinder motor, as some people, especially in England, seem to believe. The six-cylinder motor will still have a long fight before it becomes standard practice, as its undoubted technical advantages are probably more than balanced by practical difficulties. The three-cylinder motor presented itself in the same light two years ago, and yet it has now disappeared. Time alone will be the judge. The single cylinder motor finds a number of adepts in the small two-seated car class, but the two-cylinder is rapidly dying; 1906 is a year of "one or four."

AIR-COOLED CARS.

Air cooling for very light machines might possibly materialize. We already mentioned under a different heading the small Italian Otav air-cooled. Under the name of "Guy" we find a small four-cylinder 12-horse-

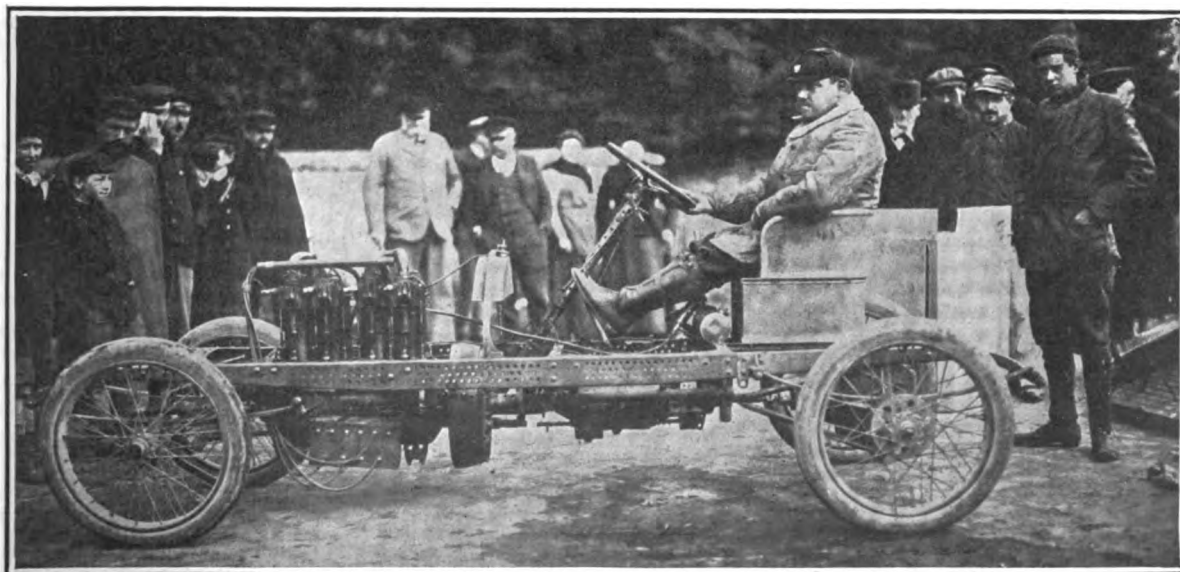


FIG. 1.—VULPES AIR-COOLED 18-24-HORSEPOWER SPECIAL SPRINT RACER, WITH WHICH BARRIAUX BROKE THE KILOMETER RECORD FOR CARS WEIGHING 900 POUNDS.

power air-cooled machine with ordinary bicycle cylinders placed tandem under an ordinary hood with a wire net in place of radiator and a flywheel fan; this, however, should not be considered as representative as it is the work of but a very small concern. We also find as air cooled the 18-24-horsepower Vulpes special sprint racing car (Fig. 1) on which Barriaux recently broke the kilometer world's record for cars under 900 pounds, but this cannot be considered as a

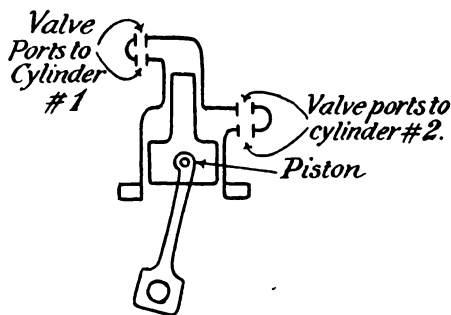


FIG. 2.—ROUGH DIAGRAMMATIC SKETCH OF BOUDREAUX MOTOR.

constructional tendency, as upon being approached the makers stated that they would not accept to supply a motor of that type to a buyer.

What is more important is the promise of the F. N. company, the largest motor shops in Belgium, to make for next year an 8-10-horsepower four-cylinder air-cooled small car.

MOTORS OF SPECIAL CONSTRUCTION.

Passing to practical engines of a type out of the ordinary, we only distinguish amongst a number of freaks the well-known Gobron-Brillié and the Boudreaux, which reverts to an old system to make two cylinders out of one, as per the rough diagrammatic sketch, Fig. 2.

The tendency concerning valve situation in the usual type of motor has already been discussed. To sum up the situation in this respect we might say:

First: General tendency for town and general service cars; valves all on one side over single camshaft.

Second: Tendency for fast touring cars, heavy machines, and powerful, fast motors; valves symmetrically placed on both sides with two camshafts.

Third: Overhead tappet actuated and automatic inlet valves disappearing.

Before leaving the subject of cylinders, a few lines might be profitable concerning their general design as regards the manufacturer. The original practice in automobile building has been to cast the cylinders in ordinary gray iron, the water jacket being made integral with the cylinder proper. In order to obtain greater lightness, and to avoid inequalities of expansion under the influence of the working heat, the most advanced practice for some time was to make the cylinder proper separate and turned inside and out, so as to have a symmetrical and as light as possible barrel

over which a separate jacket was fitted for the cooling water, the head and valve chamber forming a third piece bolted on. C. G. V. and Panhard adopted this practice at the beginning of the century and the latter went so far as boring the cylinders out of a solid steel billet.

This practice was somewhat altered by Mors at about the same time, their process being to hydraulically force a bored-out steel liner inside a cast aluminum base common to the four cylinders and forming at the same time the crankcase top and the cylinder's water jacket.

The practice of making these assembled cylinders became almost general around 1902, but it was soon found that for prolonged, hard work it was not possible to make joints that would properly hold between the cylinder and its jackets unless some quite special systems (which were soon patented) were used. Besides, such a construction is rather expensive. The net result is that this system has now been entirely abandoned by the majority of makers, the only ones keeping it in France being Panhard on his racing machines, and Sultan on all motors; in Belgium, Germain, and in England, Arrol-Johnston—the two latter for all their cars, even 'buses.

A half measure which is extensively followed, and is on the increase, to make the water jacket walls integral with the cylinders but with very large inspection holes, covered by screwed-on plates, this being now the standard C. G. V. practice, and carried to its utmost in the Renault 1905 racing car, in which the cast jacket walls were just a skeleton jacket covered by screwed-on copper plates hammered by hand to a suitable shape.

PISTONS AND CRANKSHAFTS.

After the cylinders, the most important parts are evidently the pistons and the crankshaft and their connecting members and accessories. Of the pistons nothing new can be said; the practice stays where it has been for years. The much lauded pressed steel pistons, which some experts from the back of the shop had been promising as revelations, did not make their appearance and are probably not to be regretted, although a condemnation would be quite as without foundation as praise, practice having not had a chance to say its decisive word.

While studying crankshafts some pretty fine pieces of machinery were found, especially several six-throw shafts of as much as five feet in length of relatively small diameters, which make one think twice when visualizing the face of the man who breaks one on the road side, if he knows the price.

Leaving monetary considerations aside, such crankshafts as were exhibited on the lightest grade of cars are perhaps the most conclusive proof of the progress which the advent of the automobile caused in metal

working trades. These were made of the hardest grades of nickel and vanadium steels, turned out of the solid ingot, bored through the pins for lightness, and milled at the throw arms to carefully studied H or other sections for the same purpose. These shafts are hardened and tempered at the bearings, the arms being said to be left soft, and the whole shaft is ground true as a final finish. Such construction had so far been used only in the very highest grades of racing cars, but is now working its way down in touring chassis, though usually in only the most expensive ones.

A French concern, the Motobloc, shows a distinct departure in crankshaft construction. In their machines the flywheel is placed between two bearings, between the two middle cylinders of the motor, the crankshaft consequently being built up of two pieces. This construction, which does not present any apparent advantage, is only useful in the case of this machine on account of the firm's principle to place the clutch and speed gearing in an extension of the crankcase.

The tendency is becoming universal to attach the crankshaft bearings to the top of the crankcase so that the lower part can easily be detached for inspection without disturbing the adjustments.

Five bearings crankshafts are slightly more numerous than the three bearings type.

CONCERNING BEARINGS.

As regards bearings, the two-point contact ball type is certainly gaining in popularity for crankshafts, as well as for all other parts of the machine. Up to last year crankshaft ball bearing users were few and far between, and the bearings they used were all of the D. W. F. type, with compensating springs and felt washers to separate the balls and give a certain amount of diametrical elasticity to the bearing.

It appears, however, for 1906, that although a number of the first users of the

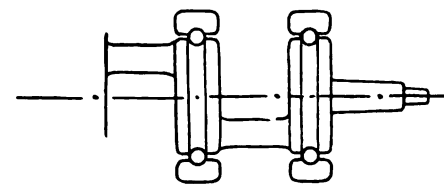


FIG. 3.—SPECIAL CRANKSHAFT BALL BEARINGS OF DUTCH CAR.

type of bearing mentioned have continued its use, the majority of the converts to the ball system are using the ordinary two-point annular type without any separating part between the balls, the remainder using types with separate balls but made upon principles different from those of the D. W. F.

On a car hailing from Holland and selling almost all its output to England, a crankshaft was shown in which the inner ball race or ring instead of being slipped

over the shaft was made integral with them, the outer diameter of this ring being larger than the double throw of the crankshaft, as roughly illustrated by the sketch, Fig. 3.

This construction goes towards reducing the number of parts in the machine and increasing the *apparent* simplicity of the whole, but entails the use of an extremely costly crankshaft which has the further disadvantages of being made out of good ball bearing steel, which does not necessarily mean good crankshaft steel, and also of making the cost of repairs prohibitive.

Where ball bearings are not used, ordinary special phosphor bronze lined bearings are used, those lined with antifriction metal being very scarce. In this type of bearings lubrication is of the utmost importance; in consequence this will make necessary some consideration of the important question of lubrication.

PROPER LUBRICATION.

Proper lubrication in an explosion motor, whatever may be its construction and its system of cooling, is an absolutely vital matter, as many readers will probably have already learned at their own expense.

If care from the user to see that proper attention is given to that part of the operation of the machine is thus an absolute necessity, there is also a vast deal of care required from the designer to see that the oiling system be such, in certainty and efficiency, that the owner's pains be well repaid. The question is not to flood anything that moves in any manner with an enormous amount of oil, as then even if the permanent damage would not be as great, it would mean just as vexatious little delays as underlubrication would cause.

It is evident that under no circumstances should more oil than necessary reach the pistons, as any surplus oil will work its way past the rings and on top of the piston itself in just about no time, and there play general havoc with the plugs and valves, which then will soon get just as gummy and sooted as heart cannot desire. In a study of the lubrication systems exhibited it is found that the great majority of makers appear to consider the problem as requiring a virtual division of the engine in two sections, the means of lubricating which are to be different in order to obtain a reasonably simple system.

The two sections comprise: First, the main bearings and the camshaft and accessory bearings, the connecting rod big end bearings. The second part comprises the connecting rod small end bearings and the pistons and cylinder walls.

The old splash system, which for years gave excellent results on the entire mechanism of the motor, is being generally abandoned by the generality of French makers, except for what we have termed the second part of the engine, for the benefit of which it still reigns supreme.

De Dion-Bouton were probably the first, a few years ago, to adopt on their two-

cylinder 10-horsepower motor a pump forming part of the engine and taking oil from a sump in the bottom of the crankcase to send it in large quantities to the main parts of the engine, this having, however, evidently been done before in machinery of a class different to that in automobiles. Their system consisted and still consists in sending the oil under the pressure supplied by the pump to the main crankshaft bearings, wherefrom it follows leads bored out through the crankshaft itself to the connecting rod big ends. The considerable centrifugal force set up in these parts splashes it to the different other parts of the engine such as connecting rod top, pistons, and distribution mechanisms, through suitable openings.

Delaunay-Belleville adopted this same practice from their very start in automobile manufacture last year, but instead of the spur gear pump used by De Dion for the purpose, they have preferred to adopt the eccentrically actuated rocking plunger pump, working without valves of any description, which was successfully used by them for years in marine machinery. They further improved this system for 1906, in which, while retaining the same principle of pump and splash, they have drilled the connecting rods through so that the oil is forced up the rods to the piston pins, wherefrom it goes in a circular trough formed around the inner face of the pistons. From this trough the oil reaches the frictional or outer face of the pistons through small holes suitably drilled through the piston walls.

Among makers fitting a special oil pump to the engine to lubricate it in the manner described, we find Mercedes, Rebour, Prunel, Radia, Aster, and others. It will be noted that with this system the oil is used over and over again, as that which has been splashed to the walls drips down again to the sump (where a sort of a gauze filter is generally fitted) and is pumped back to the working parts, the system being often compared to the continuous circulation of blood in the human body.

The comparison is, however, defective, as it very clearly points out the defect in this system. In the human body the heart pumps the blood to have it purified (oxygenized) before sending it again to the arteries; in the engine the pump takes the already used and consequently impure and already slightly carbonized oil to send it again to the working parts, so that after a period which is generally 200 miles, on the majority of French cars, the oil which has been getting "worse and worse" all the time has become worthless as a lubricant and has to be changed. If pure oil is simply added, it will mix with the used up oil and the result will be double or almost double the quantity of an impure oil, while if the user will take the trouble to empty the sump entirely and fill it again with pure oil, the proper course will have been fol-

lowed, but at the expense of time spent on a rather nasty job.

This system, however, presents the important advantage of having no long pipes to freeze and clog, as all the oil leads, being contained in the engine itself, are kept constantly warm, while the oil is working under a high pressure, generally 2 to 2 1/2 times the atmospheric pressure, so that obstructions are not possibly allowed to stay in the leads. The only moving part is the pump, and this is a strong and large part, very unlikely to give trouble, while there are no outside connections and pipes to give trouble, leak, or break.

The system, however, possesses the drawback of being rather expensive, one reason why a number of makers still prefer the perhaps less expensive methods of forcing and distributing the oil by outside means. In the latter case, the oil is placed in an independent tank from which it is forced to a row of sight feeds conveniently placed, generally on the dashboard, and thence it drips into pipes leading it to various parts, in quantities just sufficient to replace the oil on the parts as it is used up, splash being used as an auxiliary. In this case, except for what is supplied by splash, it is always pure, clean oil that reaches the working surfaces, but the system is nevertheless probably inferior in that it is much more liable to break down than the former.

The methods employed to force the oil to the sight feed vary, sometimes pressure from the exhaust or the water jacket is supplied direct to the tank, while at other times special small plunger pumps actuated by means of belts, chains, or eccentrics are used. Departures from these two systems are found on several Italian cars, where the delicate small pumps used to supply the sight feeds are dispensed with, their place being taken by a light shaft inside the oil tank carrying tiny pulleys, and driven through light chains from an upper equally small shaft with similar pulleys, the chains on these shafts being fitted with small buckets, just like a miniature grain elevator. These buckets deliver the oil they contain, when they reach the upper shaft, into pockets forming the top part of the sight feeds.

A device which might be classed with the lubricating means first described is the Cornilleau-Sainte Beuve, in which the oil pump feeds its large quantity of oil to a set of short pipes, fixed to the outside of the crankcase, these pipes supplying the oil to nozzles, which spray it to the different parts of the motor, the surplus oil falling to the bottom of the case, to be pumped out again.

The power-generating and transmitting portions of the engine having thus been examined, we shall now turn our attention to other parts, which might incorrectly be termed accessory parts, the word not being quite proper, since the engine could not be operated without them in the present status of our knowledge.

(To be continued.)

"SMALL" AND "POPULAR-PRICED" CARS.—II.*

By RENE M. PETARD.

PARIS, Jan. 20.—Leaving the interesting Sizaire & Naudin machine, we will pass to the S. V. P. small car (shown in outline Fig. 1), made by the Société des Voitures Populaires, in which the end aimed at by the designer also was to do away with all unnecessary components and to simplify as much as possible the parts which must of necessity be preserved, so as to be able to make a machine in which quality of material and quality of workmanship will in no way be reduced in comparison to that of even the very best grades of cars. A quality to be found in this car (as well, by the way, as in the one previously described), and which is generally lacking in cars of the same price and capacity, is that of

single block with the engine, and is consequently also placed crosswise under the hood; it is of the sliding-gear type, giving two speeds and reverse with a single lever, the drive being direct on the high gear. The shafts of this part of the machine are all mounted on two-point ball bearings (Hess-Bright type), made by the D. W. F. Co., which supplies a large portion of the bearings used by the French makers.

The preceding parts, although especially designed to reduce cost, show little if any entirely new departures from current practice; it is now that such alterations will be found to a greater extent. First in the transmission, which, instead of being through gears or chain, as is usual, is by means of a special belt formed of chrome

much as no differential is fitted, the fastest revolving wheel when taking a curve simply revolving free on its axle end, until the speed of the rear wheels become equal again.

This construction, which had been given up a long time ago for heavy and high-powered cars, seems to be enjoying a revival since several concerns are attempting to bring it back to life.

The usual brakes are fitted—that is, one (foot-actuated), working on the driven belt pulley, while the side lever actuated brakes are located inside drums on the rear hubs, where they work in oil, being consequently of the internal expanding type.

The front axle is of tubular construction, and the Lemoine type of knuckles so ar-

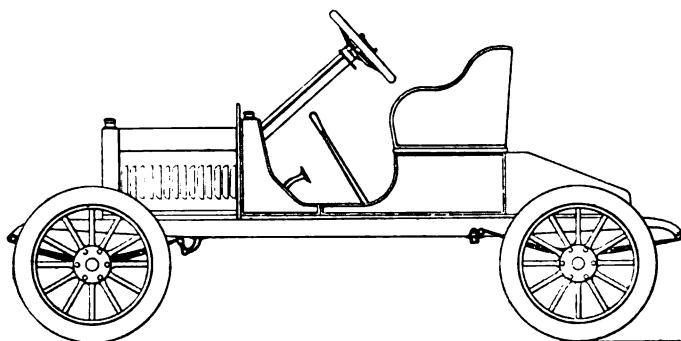


FIG. 1.—SMALL CAR OF SOCIÉTÉ DES VOITURES POPULAIRES.

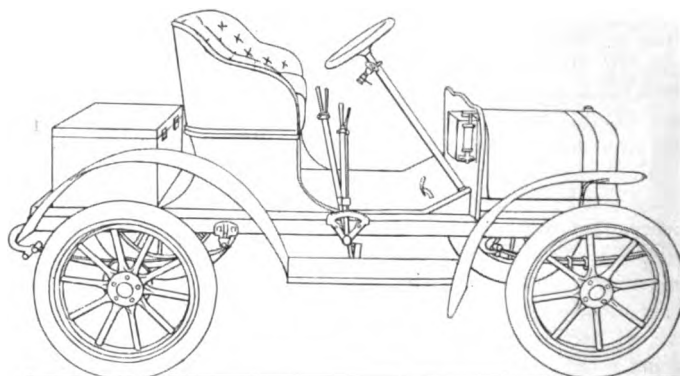


FIG. 4.—LE PASSE-PARTOUT SMALL CAR.

harmony and unity of design; by this it is meant that in this machine every single part, even the less important, shows evidence of having been thought out specially for its work and to harmonize with its surroundings.

The motor is a vertical single cylinder, having its mainshaft crosswise on the chassis, and located underneath the usual type of folding hood; the valves are both mechanically operated and the ignition is by a low-tension Simms-Bosch magneto, with mechanical make and brake inside the cylinder. The carbureter is automatic, the supplementary air supply being regulated by an automatic poppet valve placed on the side of the mixing chamber casting, while the cooling is by a gear-driven, centrifugal water pump, sending the water into the engine, wherefrom it returns through large diameter piping to the top of the radiator, which forms the front of the hood in the ordinary way. This radiator is of the finned tube variety, and the tank is formed around it as in big car practice. The whole of the power plant gives evidence of scientific and practical design.

The speed-changing mechanism forms a

leather, working on edge, and disposed as shown in the sketch (Fig. 2). This belt has been used for some time on machinery and in cases of special duty, and this is the first instance of its application to the driving of automobiles. The results seem gratifying, and if only the public would give up a little of the prejudice which is so often found against belt drive the great advantages of this in silence and smoothness would certainly be appreciated. The clutch is entirely dispensed with, the belt being simply slackened sufficiently when a free engine is desired. It is said that a special apparatus is fitted to this car which creates a tension on the belt proportionate to the driving pull required from it, but no details could be had concerning it, the man at the stand being rather shy to give details.

The belt drive in this machine should work quite well, as it is absolutely protected from outside agents of disturbance, such as mud, wet, or dust, and also because the distance between pulley centers is exceedingly long. The drive from the belt is to a pulley keyed on the rear axle's driving shaft, which is also mounted on two-point ball bearings. This axle is peculiar, inas-

much as the axis of the pivot meets the ground at the center of the tire's surface in contact with the ground, thus assisting very materially the claim of irreversibility made in respect to the steering gear.

Another new two-seated small car shown was the Otav, exhibited and made by the well-known Italian bicycle and motorcycle firm of Turkheimer. This machine is well worthy of interest, especially because it was the only notable example of air-cooling at the show. It has an armored wood frame carried on springs—modeled after the Oldsmobile runabout—which are clamped to tubular axles resting on bicycle type tension wheels.

The motor is a 5-horsepower single vertical cylinder under the hood in front, and is fitted crosswise in the car, as shown in the engraving, Fig. 3. The inlet valve is automatic and is fed by the vertical tube seen in picture, this tube coming from a very simple automatic carbureter. The exhaust is led into a small silencer underneath the footboard. The cooling arrangement is on the same principle as that of the American Frayer-Miller car. On one side of the engine crank case, in which the flywheels are enclosed, a second casing is

Continued from page 180, issue of January 18, 1906.

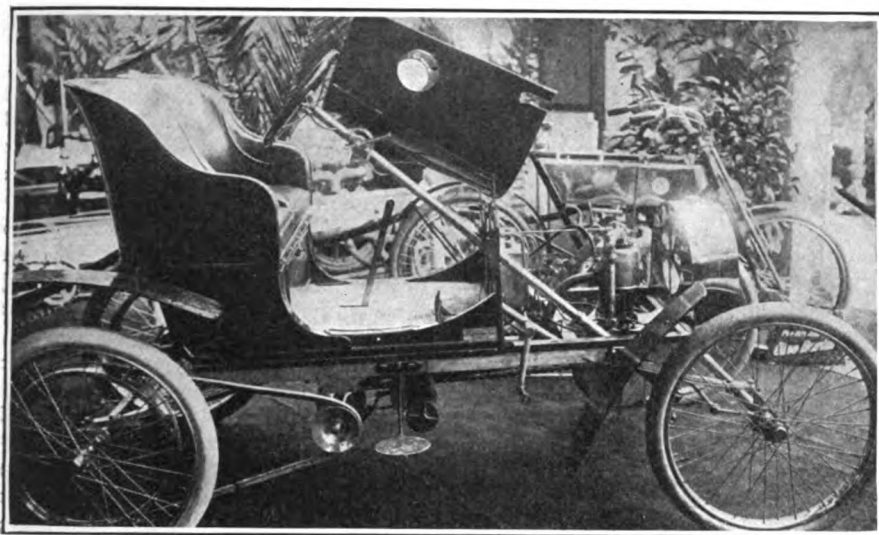


FIG. 3.—AIR-COOLED 5-HORSEPOWER OTAV SMALL ITALIAN CAR.

bolted which is of the full diameter of the crank case and contains a powerful ventilator. This ventilator takes air from its center and by centrifugal action sends it to a vertical lead, wherefrom it is violently blown on the center of the cylinder head, and then descends along the cylinder walls, which are fitted with a narrow cast jacket for the purpose of forcing the air to a close contact with the heated parts of the engine.

The shaft extension, which carries the blower, further carries a small chain sprocket which drives a countershaft under the footboard. On this countershaft are keyed three pulleys of the motorcycle V belt-driving pulley type, one being keyed at each end of the countershaft and the third at the center of the shaft. The extreme pulleys are used to drive each of the rear wheels exactly as in a motorcycle, while the middle one is used as a drum on which a foot-applied brake contacts. The clutch is

fitted at the rear sprocket of the chain drive before mentioned, and the machine is without a differential, the slip of the belt being supposed to attend to the differences in speed of the two driving wheels. The hub brakes are applied by means of wire ropes, attached to the second foot pedal.

The engine is controlled by hand levers on the spark and throttle, these levers being fitted on the steering pillar, below the wheel, and their motion being transmitted through Bowden flexible wires. The motor is started by means of a crank fitted behind the front right-hand mud guard, the motion of which is transmitted by a bicycle chain to a free wheel clutch on the engine's main shaft. The gasoline is carried in a large tank in front, which takes the place of the usual water tank. This fuel tank has a large opening in its center to permit an air draught on the engine, the air that thus passes through the tank being at the same

time intended to prevent any rise in temperature in the tank, which might possibly be warmed up by the radiation from the motor.

Machines of not so special a construction are the Passe-Partout, the Hellée, and the Prosper Lambert, which are simply reduced and cheapened models of the standard type of automobile.

The Passe-Partout, Fig. 4, is undoubtedly the most advantageous one of the three, both as regards price and workmanship. The frame is of armored ash wood, with an angle steel subframe, the tread of the machine is 31-2 feet, and the wheel-base 6 feet. The car is fitted as the buyer prefers with a De Dion or a Buchet motor of 6 horsepower, the De Dion being fitted with automatic inlet valve and the Buchet with a mechanical overhead inlet valve actuated by a push rod and rocking lever. Magneto ignition is fitted supplementary.

The clutch is of the direct leather cone type, the clutch actuating pedal applying the countershaft brake when pushed to the very end of its range of action. The change speed gear is worthy of special notice, as, although it is not new, it is a well-made

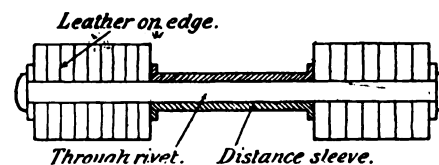


FIG. 2.—SECTION OF BELT DRIVE OF SMALL CAR, OF SOCIÉTÉ DES VOITURES POPULAIRES.

and durable example of a type which was discredited, rather undeservedly, by some poorly-made and short-lived imitations. In this system the outer appearance is exactly similar to that of a sliding gear system, namely, two parallel shafts, inclosed in a

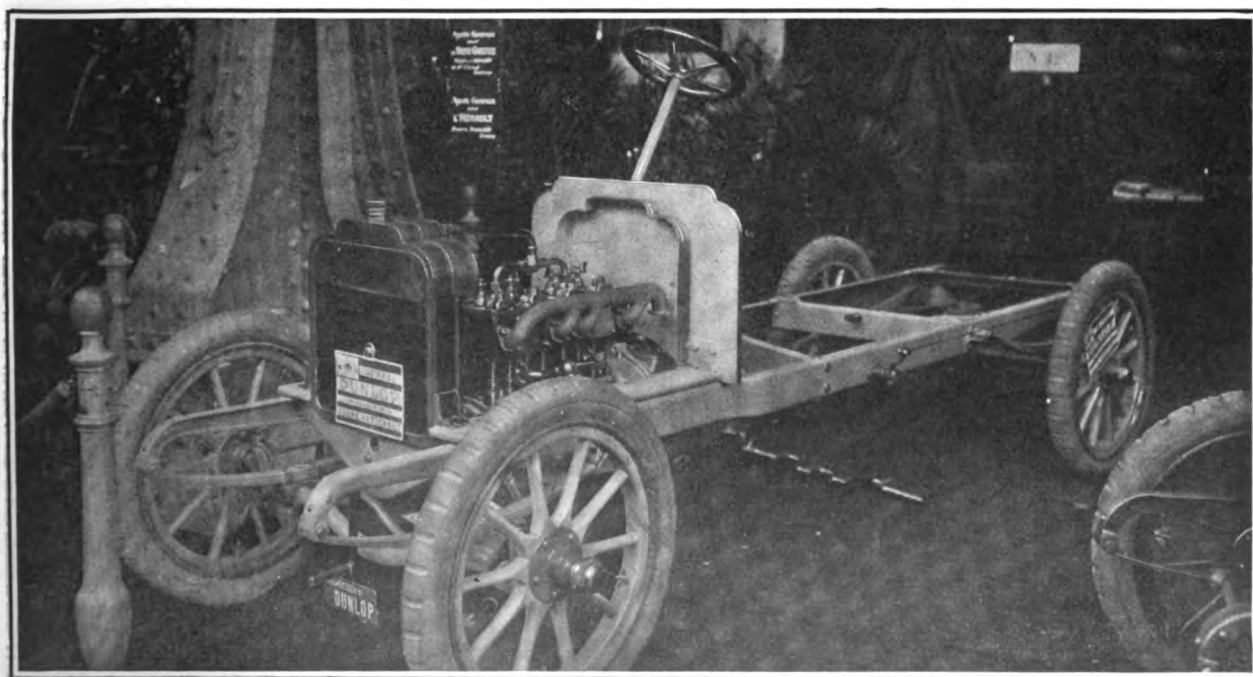


FIG. 5.—CHASSIS OF PRIMA FOUR-CYLINDER SMALL CAR AS EXHIBITED AT THE PARIS SALON.

stationary aluminum gear case. But there the resemblance stops. The gears inside are constantly in mesh, there being no direct drive on any of the speeds. The gears on the primary or driving shaft are rigidly keyed to same, while those on the secondary shaft are idle on it and are kept from all lateral motion by the length of their hubs and also by special sleeves which are interposed between them. Keyways are, however, cut inside the gear hubs, while the secondary shaft—which can be slid without sliding the gears it carries—is formed with feathers which come in engagement with any of the gear wheels, thus causing the drive to be transmitted through any of the pairs of gears at the driver's will. A neutral position is of necessity provided between each speed change. There are three speeds and a reverse in the case of this particular machine. The drive is by propeller shaft to a strong rear axle. The steering is irreversible, being of the worm and sector type. The same description equally well applies to the Lambert and the Hellé cars, the only difference being that in these two machines ordinary sliding gear transmission is used. Their prices are also higher.

The Demeester small car, made by the well-known motorcycle racing man, can well be considered as a transition between the small car proper and the popular car, according to the significance which was attached to these words in the opening of this article.

This machine embodies in its mechanism most of the features of the popular car, and can only be classed with the small car on account of its carrying capacity, which is comfortably and safely limited to two passengers. The frame is of pressed steel, with forged spring horns. It carries on a low subframe a four-cylinder 8-horsepower motor, the four cylinders of which are cast in one single piece with the top of the crankcase. The bore and stroke are respectively 2.3-4 and 3 inches. The valves are mechanically operated on each side of the engine over separate camshafts, and the flywheel is external but does not contain the clutch. The ignition is by coil and battery or high-tension magneto, as the customer may prefer. The radiator is a tubular construction, giving the appearance of a honeycomb; the water circulates through it by thermo-syphon or natural circulation.

The clutch is of the metal-to-metal adjustable expanding type, contained at the front of the gear box and inside of it—it does not give any axial thrust. All the bearings except at the crankshaft are on balls, two points system, the speed change gives three speeds and reverse with direct drive on the top gear. The drive is taken by a propeller shaft to the rear live axle, which is also mounted on balls, with ball thrust bearings wherever any end pressure is to take place. All three brakes on wheel hubs and propeller shaft are internal and

absolutely inclosed, working in oil. The hub brakes are balanced by means of a cross beam. The steering is by worm and sector, with engine controlling levers on top of the wheel. The wheelbase is 6 feet 6 inches, and the tread 3 feet 9 inches. The wheels are 28 inches, with 3 1-2-inch tires. The consumption of fuel is one-quarter of a gallon of gasoline for 10 miles, and the maximum speed with two up 40 miles an hour on good roads.

Absolutely the most striking example of the popular car exhibited in the Salon was the Prima machine, shown by L. Lefebvre, and said to be manufactured *a l'Americaine*. Inquiry showed that the machine was made in Paris, but that the construction being undertaken in fairly large quantities, the maker's advertising pretension was somewhat justified. This machine met with a fair amount of success with the general public, and favorable agencies are said to have been placed for foreign European countries. It is shown in Fig. 5.

The Prima machines are made in the single-cylinder, 8-10 horsepower, and in the four-cylinder, 10-12-horsepower sizes. The

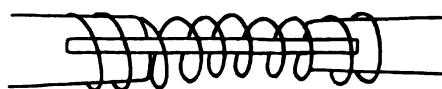


FIG. 7.—COUPLING CONNECTING PUMP AND CAMSHAFT ON PRIMA CAR.

chassis dimensions, the general appearance, and even all the mechanical details, are exactly similar in both machines save for the length of the crankcase and the number of cylinders. In these machines the engine and gear box are made as a single component, consisting of three gray iron castings, bolted together at their ends, the whole being bolted at the front end to the front cross member of the frame underneath the radiator, by means of three stout bolts, and at the rear end to the central cross member of the frame in the same manner, no other means of securing the power plant to the frame being used. The frame is of pressed steel, narrowed out at the front, and is carried on four half-elliptic springs of good length, but perhaps rather weak in section. The drive is by propeller shaft, with two cardan points, the rear one being of the rounded-square sliding type to allow for end play. The front one is of the ordinary two jaws and central cross type. The wheels are 28-inch artillery, and are fitted with Dunlop corrugated tread tires as a standard. The hubs

are malleable castings; this is to be regretted, as more suitable material could easily have been secured without any appreciable increase in price, considering the quantities said to be manufactured. The front axle is tubular and sweeps downwards, its ends are brazed into Renault pattern cast knuckles. The steering is of the rack and pinion type, and all the connections are ball and socket. The steering wheel is of fair diameter, and it is (as well as its pillar) absolutely free of any lever or handle of any kind.

Turning now to the details of the mechanism, the accompanying sketch, Fig. 6, shows the general arrangement of the different parts to make them a unit, as before explained. The trough-shaped casting S is intended to be of steel in future, but was of bronze in the machines exhibited. This casting, which forms a half-circle in section, would be of about 8 inches in diameter if the circle were completed, and is about 10 inches long. It contains the extensions from the engine's shafts—the crankshaft extension, which carries a small pulley for the fan's round belt, and the starting crank's pin, the front end of the casting carrying the starting crank proper. The camshaft extension carries a sort of simplified Oldham joint, which is as shown in the rough sketch, Fig. 7. The ends of the pump and camshafts are slotted for about 1-2 inch of their length by a saw cut, a flat sheet steel plate of the same width as the diameter of the shafts, of the same thickness as the width of the saw cut, and of sufficient length, connects both shafts. It is dropped in the slots and is prevented from falling out by means of a coil spring which covers the whole and extends for a fair length over both shaft ends. The water pump, which is of the gear type, is itself contained inside this trough-shaped casting, as well as the jump-spark timer. This is rather unusual in construction, for the shaft which carries it (the camshaft) extends right through it to the pump. This trough is also to contain the driving mechanism for a high-tension magneto, this being fitted as an extra.

All the valves are placed on the same side of the cylinders, over a single camshaft, and are mechanically operated. The cylinders are cast in pairs. The situation and shape of the exhaust lead are quite in evidence in the accompanying photograph, from which, also, the respective positions of the inlet and exhaust valves will

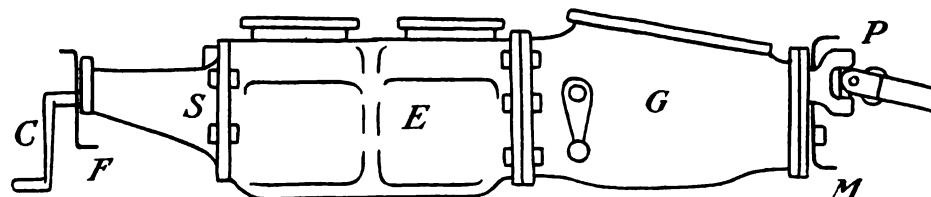


FIG. 6.—ASSEMBLED CASTINGS OF CRANKCASE AND GEAR BOX OF PRIMA CAR.
E, Engine crank case. G, Gear box. S, Front support. M, Central cross member of frame. F, Front cross member of frame. C, Starting crank. P, Propeller shaft and Cardan joint.

readily be seen. In order to avoid the complication of an inlet piping, the carbureter is placed on the opposite or right side of the engine, and the passage to the single inlet valve chamber (used for each pair of cylinders) is formed integral in the casting between the two cylinders, and opens at the other side of the motor where a very short elbow connects it to its side of the carbureter. The water circulation is by pump, as before mentioned, the water being taken by the pump at the bottom of the horizontally coiled, finned-tube radiator, and sent to each of the cylinder castings through a brass lead just visible in the photo above the front wheel; the water then leaves at the top of the cylinders to go to the large tank above the radiator.

Compression release taps are fitted in the top of each cylinder's combustion chamber, while the sparking plugs are placed above the inlet valve. The plugs closing the valve inspection holes are held down by a single nut and a yoke for the two valves of each cylinder.

The crankshaft is of the ordinary four-throw type, the flywheel being placed inside the gear box and carrying the clutch in a drum formed on its rear face. This clutch is of the metal-to-metal expanding type; it merely consists of a band expanded by a toggle lever action, actuated by a central sliding cone under spring pressure, the arms bearing upon the cone being fitted with rollers to reduce wear. The gearing gives three speeds and a reverse. The drive is direct on the top gear, but the secondary shaft and the reverse pinions are constantly in mesh and thus rotate continuously. The reversing set is held in its place by a coiled spring.

The bearings in the gear box as well as throughout the car are of the single-piece bronze sleeve type, with no provisions for adjustment, except the central crankshaft bearing. A drum is carried at the rear of the gear box upon which acts an external band brake—camel-belted lined. The hub brakes are of the same type, although larger.

The back axle is of the ordinary live type, the wheels being carried by the driving shafts and not by the axle tube. There are no spring horns at the back, the springs being shackled direct to the frame sides. The torsion rod system is simple and efficient, but was described elsewhere.

In the one-cylinder machine the general lines are the same, the difference being simply in the engine which carries a single cylinder with consequently a shorter length for the whole power plant. The flywheels are in this case internal and form the crankshaft as is the usual practice, the flywheel inside the gear box being nevertheless preserved identically as in the four cylinder model.

The general lines of the engine are similar, the camshaft being directly above the main shaft and the valves being side by side in front of the cylinder, crosswise in the car.

The price of the single cylinder chassis with the tires and long enough for a short side-entrance body is \$380, while the price of the four-cylinder chassis is \$780. These prices are ridiculously low, and if this only is considered the car is certainly excellent value for the money. It is unfortunate, however, that better materials should not have been selected for some of the parts, as this would not have increased the price appreciably and would have made a better vehicle for hard work. It seems to be the general opinion that the makers of this machine overdid their desire to make a wonderfully cheap car with a big capacity. They made a machine less expensive than the average small car, while the French public was prepared, and will probably prefer to pay more than the price of a small car for such a machine—of course to a reasonable amount justified by increased quality.

(To be continued.)

Westrumite in America.

Westrumite, which has been used so extensively in Continental Europe for laying dust on the roads, especially those selected for the great automobile racing routes, is now being manufactured at a plant established last fall at Whiting, Ind. Attention was drawn to the process in America by an experimental treatment of two miles of the Midway drive in South Park, Chicago, which has developed such satisfactory results that the further use of Westrumite is urged as a preventive of dust, mud, and other undesirable road surface conditions.

In the stretch treated, two treatments of a sprinkling of a 10 per cent. solution, 90 per cent. water, were used, a day intervening between the applications; then three applications, eight or ten days apart, were used with a 3 per cent. solution, with the result that the surface layer has become

caked to such an extent that neither wind nor traffic raises any perceptible dust, and the water during a rainfall runs off the surface, so that mud formation is prevented.

The basis of Westrumite is crude mineral oil, so treated that it possesses the quality of solubility in water, rendering its application an easy matter. While the results attained are declared to be in every way as favorable as those following treatment of a road with crude oil, the disadvantages of the latter are absent. Westrumite has no perceptible odor and forms such an intimate contact with the particles composing road surfaces that there is no tendency to mud formation from rainfall.

The manufacturers, the Westrumite Company of America, claim the greatest possible advantages of their product as a binder for road building, and state that the thickness of the road-body may be materially reduced because of the impermeability of surfaces treated with the preparation.

The field of usefulness of Westrumite is not confined to the laying of dust on dirt or macadam roads, for it is recommended as a superior substitute for oil, tar, and asphalt in road building of all kinds. In laying stone block, wood, or brick pavements, a solution of 25 to 50 per cent. of Westrumite is used to saturate the sand foundation of the blocks, and this is claimed to entirely prevent the sand from driving up the joints under pressure from heavy traffic.

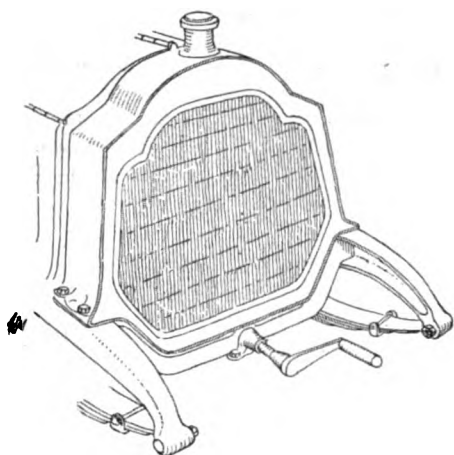
For macadam road construction, a 25 per cent. solution is recommended, to be used in combination with the binding material and the sand, and a 5 to 10 per cent. solution sprinkled in front of the road roller. The amount of rolling required is less, since the Westrumite binds the roadmaking materials together more rapidly than water, and so softening of the foundation and partial pulverization of the upper layer is avoided.



AUTOMOBILES AWAITING THE DEPUTIES AND SENATORS IN THE GRAND COURT OF THE PALACE AT VERSAILLES DURING THE ELECTION OF THE NEW PRESIDENT-ELECT OF FRANCE, M. FALLIERES.

Cooling Systems in Water-Cooled Cars.

IF one may judge by the character of the radiators seen at the two New York shows, the supremacy of the square tube honeycomb cooler is nearing its end, and the



PACKARD TYPE RADIATOR.

popularity of the corrugated flat tube radiator is likewise on the wane. The reason is the same in both cases, viz., the liability of these forms of radiator to start leaking from vibration and straining of their supports, together with the difficulty of curing permanently leaks due to these causes. Perhaps the commonest type of radiator seen was that having a set of three or four flattened tubes bent zigzag and packed into a sheet-metal framing, with flanges stamped out in suitable shape to be strung over the four tubes. These tubes are connected at top and bottom, and the radiator has a miniature tank at the top for convenience in refilling. The base of the radiator is frequently a ribbed brass casting, which has no water joints with the tubes but serves simply as a support. In some radiators seen constructed in this manner, an overflow tube about 3-4 inch in diameter was arranged to connect the little filling tank with the lowest point of the radiator, apparently for the purpose of conserving steam or vapor that would otherwise be

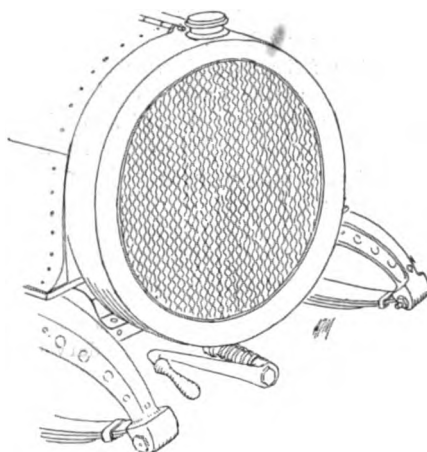
lost. In addition, however, a regular overflow tube was supplied.

In other radiators of the air tube and semi-honeycomb types the brass pump casting was likewise used for its strength, but in this case it necessarily formed an integral part of the radiator structure.

Other radiators, in which supporting lugs were simply soldered to the sheet-metal sides, were frequently arranged to be supported on the front cross member of the frame, which was dropped to pass under the radiator, and the side supports served only to steady the radiator.

On the Fiat the radiator was supported on trunnions at the sides, leaving it free to rock slightly back and forth. The water pipes from the engine to the radiator were large and stiff, and the rubber hose connection was short and very firmly clamped to the pipes, evidently with the purpose of steadying the radiator.

The geared circulating pump, which at one time was almost completely dropped, because attempts were made to locate it above



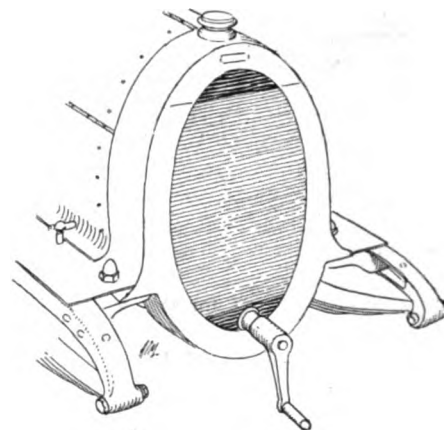
NATIONAL TYPE RADIATOR.

the lowest possible water level so that it was not self-priming, is being restored to favor on a number of cars; but the centrifugal pump still holds by far the leading position, owing, it would seem, to the fact that it does not wear out and that it will permit the water to circulate by gravity in case the pump should for any reason fail to feed.

Two cars at least, the Pierce and the Haynes, have eccentric pumps, consisting of a barrel revolving eccentrically in a pump chamber, and having a pair of blades working in the same diametrical slot, and pressed outward by springs cast in the walls of the circular pump chamber. The water enters close to the revolving barrel on one side and leaves at the same relative point on the other side. In the Welch the pump is built right into the radiator, and is run by the same shaft that carries the fan. Further particulars could not be definitely learned, but apparently the radi-

ator is partitioned horizontally on the line of the pump, so that all the water has to pass through the latter before it can go from the top to the bottom half. The new Ford runabout likewise has a pump in the base of the radiator.

Exterior outlines in radiator (bonnet) fronts follow the designs of previous years,

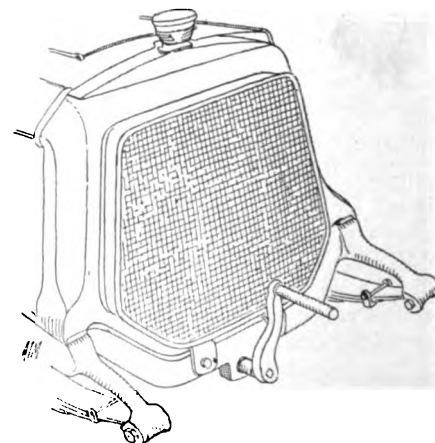


ARIEL TYPE RADIATOR.

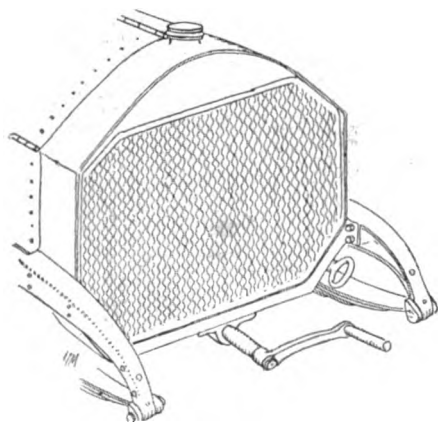
and in general the results are pleasing to an artistic taste. The circular front which has been characteristic of the National cars, was seen also in the Delaunay-Belleville, exhibited here for the first time this year. A novelty is the oval radiator of the Ariel car which looks well and certainly gives a touch of individuality to this machine.

Atwater Kent Generator.

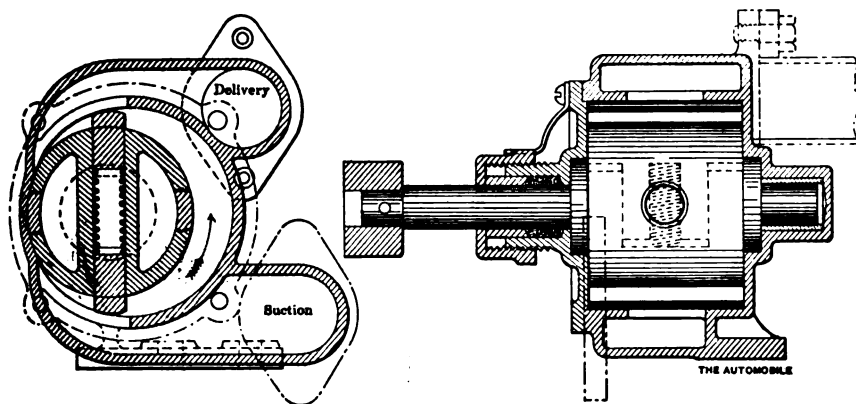
A device that concentrates in one unit the entire system for jump spark ignition, except the batteries and plugs, has been placed in the market under the name Atwater Kent Spark Generator, by the Atwater Kent Manufacturing Works, 44 North Sixth street, Philadelphia. It avoids the use of separate magnetic vibrators and distributor, all the required parts being contained in or on a single box, of the size of the ordinary coil box, which is attached to the dash. This box is shown in Fig. 1, on the following page, and the



PANHARD TYPE RADIATOR.



LOCOMOBILE TYPE RADIATOR.



SECTIONAL VIEWS OF PIERCE ECCENTRIC ROTARY WATER PUMP.—See Page 350.

single vibrator is shown separately in Fig. 2.

Advantages claimed for this spark generator are its simplicity, convenience and durability and a great reduction of battery current consumption.

The principal feature is the mechanical vibrator which is attached to the exterior top of the box. This differs very much from the old style make-and-break sparker, which it resembles in appearance; it fulfills the functions of both vibrator and distributor. There are two platinum contacts, one at *D* and the other at the end of the screw *F*. The former is carried by the elbow lever *C* which is pivoted at *R*. A spring *J* normally keeps the contact points separated. Screw *F* is for adjustment of the points. Shaft *N* is driven by the engine and revolves counter clockwise and, for a four-cylinder engine, has four notches like the notches of a ratchet. As the shaft rotates it carries forward (left) over the top a small steel piece, *B*, termed a lifter. The forward motion brings the spiral spring *A* in tension. When the continued turning of the shaft releases the lifter from engagement with one of the notches the spiral spring returns it quickly to its original position. As it starts backward it raises the steel piece *C*, causing contact of the points at *D*. The contact closes the primary circuit and magnetizes the iron core of the coil. Then, before *B* reaches its normal released position it allows *C* to fall again, breaking the contact of the points, whereupon the core of the coil is discharged and a spark produced at one of the plugs.

This cycle of movement is repeated for each notch in the shaft *N*. All of the parts are made very light to permit of a very quick release and result in a sudden break that produces the same size spark for all engine speeds. With a four-cycle engine, shaft *N* is geared to turn twice for each revolution of the engine shaft, producing a spark for each explosion stroke. A flat spring *E* holds the piece *C* in position and the milled screw *G* locks the adjustment of the contact screw *F*. The spark advance lever is secured by screw *I*.

Instead of being broken in two places, as with the ordinary timer and vibrator,

the current is broken in only one place, where the break is protected by the condenser of the coil and practically no arcing occurs.

The photograph of the generator complete (Fig. 1) shows one side with the

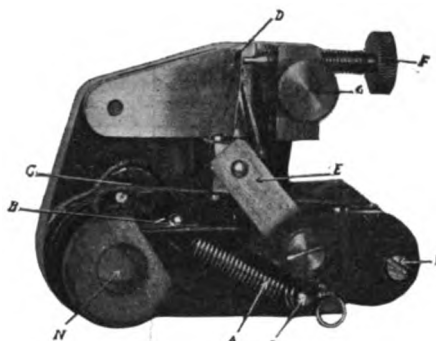


FIG. 2.—ATWATER KENT VIBRATOR.

cover over the vibrator removed. The cover is the same as the cover on an ordinary coil box. The four secondary current wires are led from the binding posts through the bottom of the box and thence to the spark plugs. One of the two primary current wires seen at the bottom of the box leads to the battery and the other is grounded. These six wires are all that are necessary for the entire system.

In the further side of the box is a removable high-tension coil without vibrator. Contact is made directly from the secondary of this coil to the longitudinal distributor *R*. A shaft *S* is supposed to be connected to the two-to-one shaft of the engine, and drives the distributor and also the mechanical vibrator on the top of the box. An advance lever *T* moves the vibrator for advancing the spark. The current is led into and out of the vibrator by sliding contacts, which allow this to be advanced and retarded without the use of moving wires. The advance lever can be connected to the hand advancer on the steering post in the usual manner. A two-point switch *W* permits the use of two sets of batteries if desired. A button *Q* projecting from the front of the box can be quickly pressed and released to close the circuit in place of the mechanical vibrator; this is for starting the engine

on the spark, and the secondary current is distributed to the proper cylinder to start the engine.

Since the vibrator is mechanical and is actuated by power from the engine, producing only one spark at a time, it consumes no current that is not necessary for firing the cylinder charges, to which fact is due the economy of current consumption. There is only one adjustment in the entire device, and no moving wires. It is asserted by the Atwater Kent company that six small dry cells are sufficient to run a four-cylinder car from 1,000 to 2,000 miles, with this spark generator.

AUTO BOAT FOR LIFE SAVING.

ASTORIA, WASH., Feb. 1.—The life-saving crew at Cape Disappointment is the first on the Pacific coast to be provided with an auto boat. This has just arrived from the East, and is a rakish craft, thirty-four feet long, and in good weather has a speed of eight knots. It is to be manned by the entire crew of eight men at Cape Disappointment, headed by Captain Charles S. Stuart, who is in charge of the station.

It is understood that the auto boat is considered in its experimental stage in life-saving work, and in case the test here proves successful, the government will install them in the larger stations on the two oceans and the Gulf of Mexico.

To the often maligned toot of an automobile horn must be attributed the saving of at least one life. Called to the door of her home by the unaccustomed siren call, Mrs. William Vosseller, living in the vicinity of Plainfield, N. J., discovered a large cat lying across the face of her infant daughter, who was being smothered to death. The cat was driven off, and, after working over the child for some time, its normal respiration was restored.

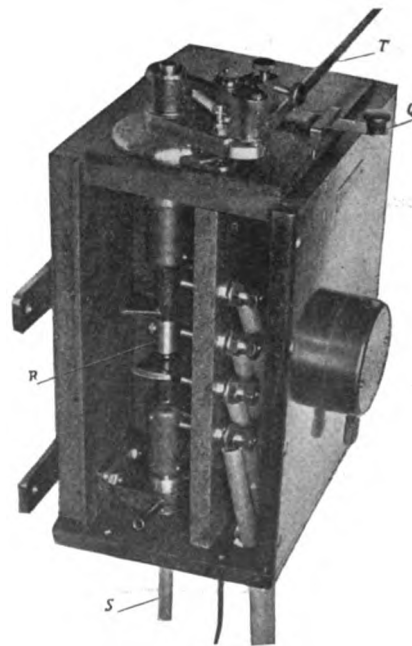


FIG. 1.—ATWATER KENT SPARK GENERATOR.

Bowden Crowned Auto Boat King at Palm Beach.

PALM BEACH, Feb. 2.—H. L. Bowden figured as the auto boat king of the second annual regatta on Lake Worth, his *Mercedes* capturing the greatest honor in appropriating the Dewar Shield. A year ago, on the Ormond-Daytona course, the athletic Bostonian had driven his racing automobile, *Flying Dutchman III*, the fastest mile of the tourney, and it was one of the two 60-horsepower engines used in that car that carried him to victory in the prettiest race of the entire regatta here this week. Undoubtedly it was such because all the contestants got away together, while in the other events the contests were of the processional kind because of time allowances.

The *Mercedes U. S. A.* made its first start on Tuesday, but engine troubles soon put it out of the running. Wednesday the Bowden colors came to the fore in the fifteen-mile event, which the *Mercedes* won in 44:01, with the *23*, owned by George Gingras, and fitted with a 25-horsepower Jaeger engine, in second place; time, 48:20. The other starters did not figure in the contest, except as "also rans."

Thursday the *Mercedes* prepared for the mile dash of the concluding day, and it was in this race that the Sir Thomas R. Dewar trophy was offered, the donor's condition being that it must be won twice consecutively before becoming permanent property.

The owner of the *Mercedes* was at the wheel with the faithful Basle in charge of the engine. The *23*, H. C. Thompson's *Limit*, of 30 horsepower, and Lieut. H. L. Willoughby's 30-horsepower, *Possum*, completed the quartette. The *Mercedes* got away in front and never relinquished the lead during the entire mile, timers Butler and Kerrison making the figures 3:06. The *23* was 28.5 seconds behind, and 21 seconds further in the rear was *Possum*, with the *Limit* well in the distance. Two trials were allowed, but the *Limit* declined a sec-

ond opportunity. Again the *Mercedes* triumphed, with the *23* second and *Possum* last, the relative distances apart being about the same, except that the *Mercedes* did not extend herself as conclusively, going the distance in 4 seconds slower time than on the first trip.

Just to emphasize again the fact that his boat could go a distance, Mr. Bowden ran away from *23* and *Possum* in an event that continued for a little more than ten statute miles. The margin at the finish was 26 seconds, and it might have been greater had it been necessary.

One of the great disappointments of the meet was the failure of the famous *Dixie* to put in an appearance. E. J. Schroeder, of Jersey City, the new owner of the boat built for E. R. Thomas, had imagined that the *Dixie* could be shipped from New York to Palm Beach in ten days, but he did not take into account the uncertainties of Southern transportation. The *Dixie* finally reached Jacksonville, but it never got to Palm Beach, and those who anticipated a royal battle between the two were forced to forego the pleasure.

The *Six Shooter*, equipped with a 75-horsepower Olds motor, and R. D. Chapin given as the owner, met with a mishap on the first day in the form of battery difficulties, and it had to be towed away. The next day a cylinder head gave way and placed it completely on the shelf for the week. One thing and another seemed to conspire in making it easier for the triumphant *Mercedes*.

A. D. Proctor Smith scored on Tuesday with *Simplex III*, of 30 horsepower, and later sold the craft to John C. King, who had been erroneously given as the owner of *Topsy*, which finished second to the *Simplex*.

The *Allon*, fitted with another 30-horsepower S. & M. motor, and owned by Tyler



THOMAS DEWAR TROPHY SHIELD.

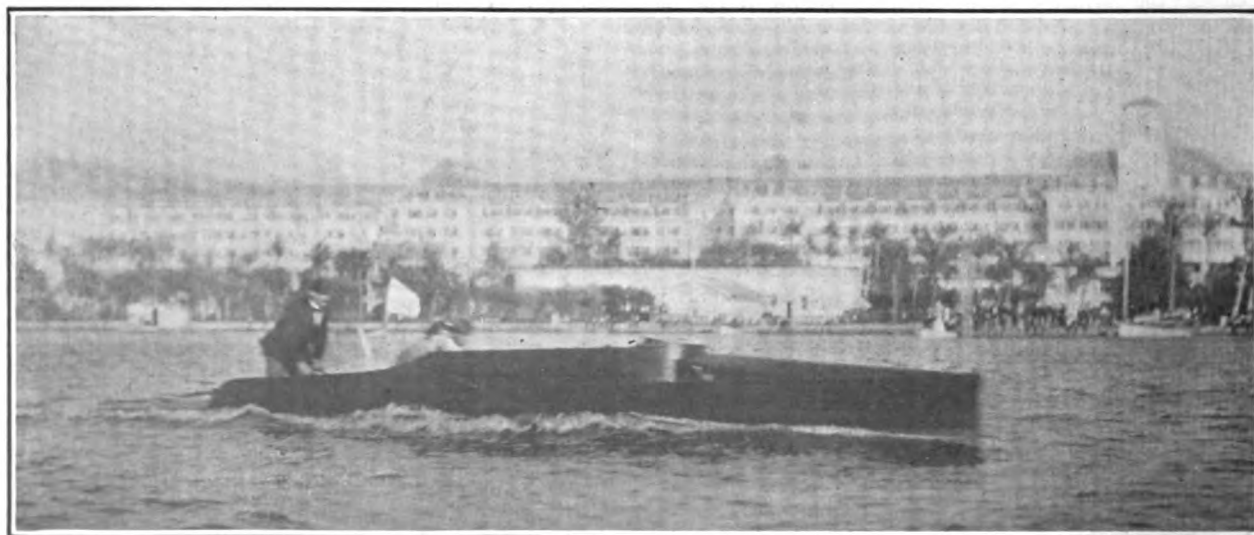
Morse, scored handily on the first day in a ten-mile race, and the following day again finished in front with a liberal allowance.

The *Carita*, with a 30-horsepower Continental motor, showed the way to the *Allon* in the afternoon ten-mile event with revised time allowances.

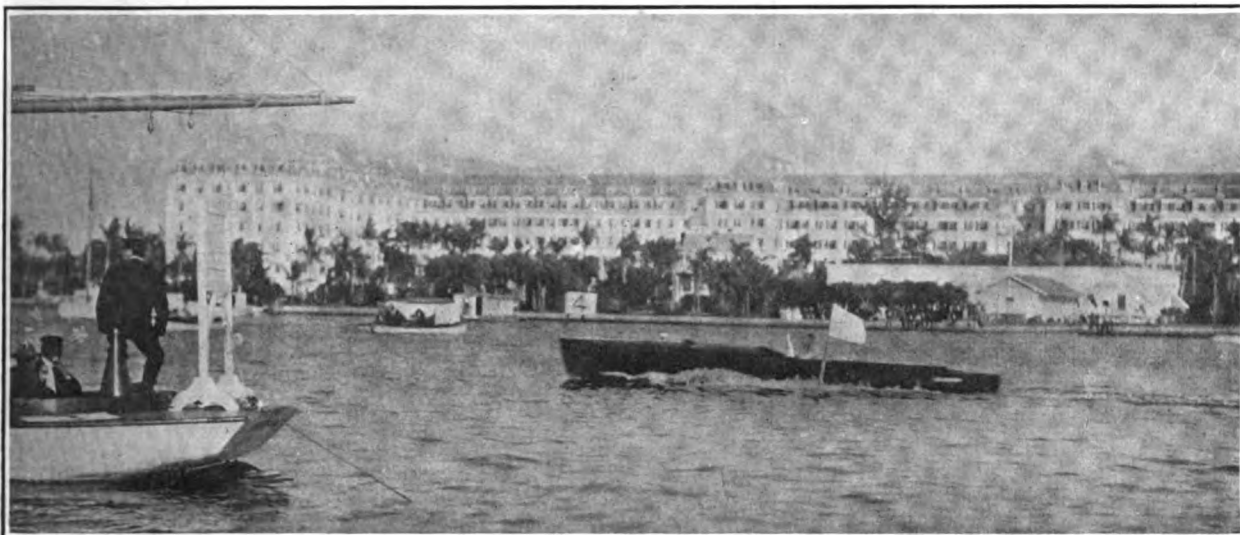
Taken as a whole, the regatta was rated a substantial success, and even now preparations for next year's gathering on Lake Worth are being considered. Commodore Frederick Sperry intends to make the Lake Worth affair the most important auto boating series in Southern waters.

Florida Meet in March.

Although nothing definite has been decided upon, it is not unlikely that the 1907 meet of the famous Ormond-Daytona course will be held in March. The uncertain weather of January has caused this change of date to be seriously considered, and it



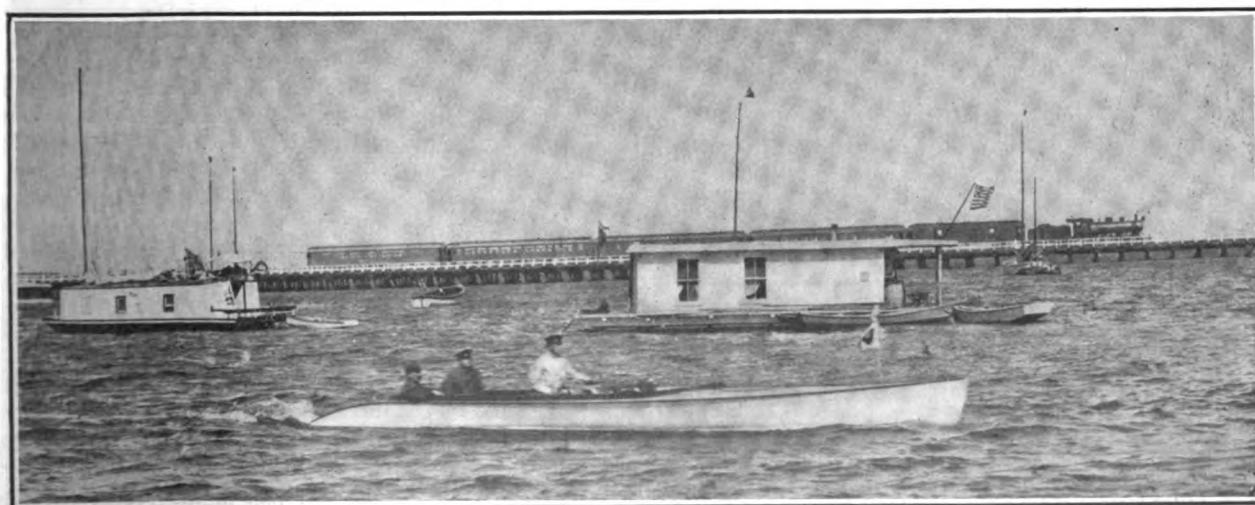
"MERCEDES U. S. A.," WINNER, DEWAR TROPHY AT PALM BEACH REGATTA, WITH H. L. BOWDEN, THE OWNER, AT THE WHEEL.



A. D. PROCTOR SMITH'S "SIMPLEX III." PASSING STAKE BOAT IN LAKE WORTH IN FRONT OF ROYAL POINCIANNA HOTEL, PALM BEACH, DURING SECOND ANNUAL REGATTA LAST WEEK.



TYLER MORSE'S "ALLON," WINNER ON TWO DAYS IN THE PALM BEACH REGATTA, UNDER FULL SPEED.



GEORGE GINGRAS'S "23," WHICH RAN SECOND TO "MERCEDES" IN FOUR EVENTS ON THE FINAL DAY—NOTE HOUSE BOATS AND TRAIN IN BACKGROUND.

may be that the Cuban race will be the beginning of the Southern series instead of the Ormond-Daytona meet.

Henry M. Flagler, the railroad and hotel magnate of Florida, was an interested spectator at the January meet, and as a result of his observations there will be some decided improvements another year. Assurances from him make it a certainty that Ormond and Daytona will be connected by gasoline railroad, making the course easy of access no matter at which end of the beach the race takes place.

Weather conditions compel eleventh-hour revision of plans for the Florida meet, and often this has occasioned much inconvenience to the spectators, principally because of the lack of transportation to the scene of activities.

The Florida East Coast Automobile Association will probably re-elect Asa Paine to the presidency, which means that the Daytona part of the meet will receive careful attention and any crudities which may have interfered in January will not be repeated.

AUTO BOAT ACTIVITY.

New Racers Building on St. Lawrence-Canadians to Compete.

SYRACUSE, Feb. 5.—Unusual activity is reported in auto boat building at Ogdensburg and Alexandria Bay this winter, and prospects are good for a lively season on the St. Lawrence next summer. Everything is being sacrificed for speed, and racing will be the sole mission of most of the boats now building.

The *Standard*, owned by Captain Leigh-



FILLING HIDDEN GASOLINE TANK IN BOW OF AUTO BOAT. AT PALM BEACH.

ton, of this city, which for three years was undoubtedly the fastest boat of its class in the world, is being remodeled for the third time and will be equipped with a new engine. L. T. Hunt, of Brooklyn, owner of the *Roma*, is having a new racing boat built at Alexandria Bay. It will be of the same model as the *So Long* and will be equipped with a six-cylinder, 50-horsepower engine.

For several years Americans have had things their own way in the big auto boat championship races at Chippewa Bay and Alexandria Bay, but this season at least two fast Canadian boats will strive for some of the honors. C. T. Munroe, of Gananoque, has had a racing hull designed and built at Alexandria Bay in which he will install a

Canadian type of automobile gas engine of high power, speeded to 1,000 revolutions per minute and turning a 28-inch, three-bucket propeller specially designed by Thorncroft.

The Chippewa Yacht Club, which has held the gold challenge cup of the American Power Boat Association for two years, has accepted a challenge for the cup from the Riverton Yacht Club of Riverton, N. Y. The races will take place at Chippewa Bay, Thousand Islands, in August.

ON WAY TO CUBAN RACES.

Among the passengers sailing from Miami, Florida, for Havana, on the 5th instant were Demogeot, Lancia and Cedrino, who took with them their racing cars for competition in the Cuban events. On the steamer with them were George P. Tange-man, Mr. and Mrs. S. M. Butler, Mr. and Mrs. Charles D. Cook and more than twenty circuit chasers and newspaper men.

Maurice Bernin is en route from New York on the steamer *Morro Castle* with a 90-horsepower Renault, and there is a strong probability that the big 30-horsepower Fiat racer belonging to Charles G. Gates will be entered in the big race.

The use of automobiles in rural free delivery work has received a fresh impetus through the decision of the postoffice department authorizing the employment of these vehicles by the carriers. For several months there had been considerable opposition in the department, it being the belief of the officials that the automobile had not yet reached a state of perfection which would warrant its substitution for the horse-drawn vehicle. Their dependability and economy has been so thoroughly demonstrated, however, that all opposition has been removed.

That the American car is steadily gaining in favor abroad may be evinced from the fact that at the recent show in Paris the Oldsmobile agent took orders for more than 350 cars.



GROUP OF HANDSOME TROPHIES COMPETED FOR AT THE FLORIDA TOURNAMENT.—Photographed on the veranda of the Florida East Coast Automobile Association clubhouse at Daytona. The wreath and crown in the case are the "Times Union" Trophy for the winner of the Two-Miles-a-Minute event, won by Demogeot, in S. B. Stevens' 200-Horsepower Darracq. The tall center trophy is the Minneapolis Cup.

TYPES OF AMERICAN SHOCK ABSORBERS.

INCREASE in the power and speed of automobiles has developed a need for some sort of device for deducing the effect of shocks to the springs and body of a car when moving rapidly over rough roads. Improvement in the quality of automobile springs has kept pace with the improvement of the cars themselves, and they are remarkably efficient in the matter of strength and elasticity; but the very elasticity that nullifies the greater part of the shock occasioned when a wheel passes suddenly over an obstruction causes a violent reflex action that thrusts the body upward, occasioning discomfort to the passengers and not infrequently breaking one or more leaves of the spring.

An automobile spring is composed of a number of leaves superimposed, with the shortest leaf resting on the spring block on the car axle and the longest at the top. In order that each leaf may contribute its individual flexibility, these leaves are not clamped together except at the middle, and they slide on one another as they play up and down. When the spring rebounds after it has been compressed by an upward thrust of the wheel, the tension of all the several leaves composing it exert simultaneous upward force. This is very powerful after a severe jolt and tosses the body upward, far past the normal position. As the body rises it carries with it the top leaf of the spring, which alone is attached to it at its two ends, and since the other leaves are not attached to the top one, the longest, and consequently the weakest leaf, alone resists the motion. Often its strength is exceeded under such conditions and it breaks.

To prevent such breakage, and also to overcome the violent rocking and pitching movements of a car body resulting from the lively play of the elastic springs when an automobile is driven rapidly over rough roads—as, for instance, in a road race, when the motion becomes positively dangerous—a number of so-called shock absorbers and suspensions have been invented and offered in the market. These are of a variety of types and they act in several different ways. Some are devised to resist the springs on the upward movement of the axle (or downward movement of the body) so that the rebound will not be violent; others offer resistance to both the upward and downward movement, and still others present no resistance when the spring is compressed, but on the rebound exert a restraining pull as the axle and side frame of the car move away from each other.

Before shock absorbers made their appearance and became popular, it was a very common practice to attach straps to the frame of the car and pass them under the axles at either end, leaving slack enough in the loops

to permit all desirable play of the springs but making them short enough to stop excessive upward thrust. Another method adopted by French racing men has been to wind the springs tightly with stout cord so as to bind all the leaves together, thus permitting all the leaves to resist the upward thrust. Within the last year or two the extra long springs have been made with ears

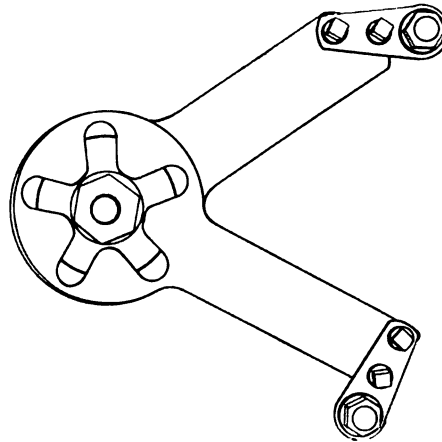


FIG. 1.—HARTFORD FRICTIONAL SUSPENSION.

at the ends of the second longest leaf turned up over the top leaf, so as to hold the two leaves together.

Herewith are illustration and descriptions of eight shock-absorbing devices, most of which have only lately been placed in the market. It will be seen that most of them operate through frictional resistance, but that others are pneumatic and one is hydraulic.

HARTFORD FRICTION SUSPENSION.

The first American shock absorber to make its appearance was the Truffault-Hartford, which was introduced about three years ago and was made by E. V. Hartford after the design of the French Truffault suspension. It consisted of two steel arms pivoted together at one end and having attached to their outer ends short steel arms to be bolted one to the side frame of the car directly above the axle and the other to the spring block or axle below. At their pivoted ends the arms were enlarged into disks and carried between them a leather friction washer. A screw bolt passing through the centers of the disks and washer held the parts together and regulated the amount of friction generated as the plates rotated relatively on the bolt. When attached to the car, the arms normally maintained a position at slightly less than right angle to each other. When the car passed over an obstruction and the wheel was forced upward, carrying the axle with it, the shock absorber resisted the movement

in just the degree of the friction developed at the joint. On the rebound of the spring, tending to pitch the frame and body into the air, the same friction absorbed the reaction as the arms slowly returned to their normal position.

This device proved very successful and quickly became popular, for without impairing the flexibility of the springs they made the action slower and prevented the unpleasant pitching about of the body, and also the breakage of the springs. A number of improvements upon the original Truffault suspension have been made during the past two years by the Hartford Suspension Company, of New York, which has brought out a new style of the Hartford shock absorber for the coming season. This is shown in the accompanying illustration (Fig. 1) and is designated Model H. It has the great advantage that it is self-adjusting for wear and needs no readjustment of tension after leaving the factory, where each set of suspensions is adjusted and tested to a uniform tension.

The tension is maintained by means of a large spring steel spider held tightly against the outer face of one arm by a central adjusting bolt which passes through the disks and carries a nut on the other side. The spring tension of the radiating arms of this spider automatically compensates for all wear. The central stud is bushed with hardened steel and is provided with an improved locking means that avoids the use of check nuts. The friction disks are of leather. The arms are of spring steel and the small arms at their ends are secured rigidly to them, resulting in a straight, up-and-down movement instead of the shearing motion of the older styles of absorber. The new device is also easier to attach to the car.

DIEZEMANN FRICTION DEVICE.

A shock absorber involving the same principle of frictional resistance is made by

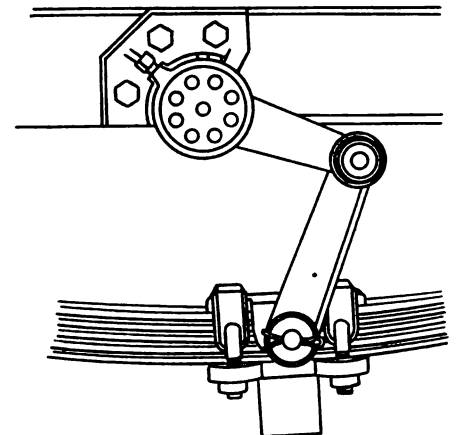


FIG. 2.—DIEZEMANN FRICTION DEVICE.

the Diezemann Shock Absorber Company, of Hoboken, N. J. As shown in Fig. 2, this has a plate bolted to the side frame of the car and a metal arm or connecting link pivotally secured to the spring holder above the axle. The plate on the side frame carries a bronze casing containing plates and fiber friction disks and a friction spindle. Tension on the friction disks is maintained by a central adjustment screw, which is held against loosening by a copper-seated locking device. The friction spindle with its plates is secured to one end of a lever arm whose outer end is pivoted to the upper end of the vertical link previously mentioned. The joint is held by a taper stud working in a fiber bushing. The action of the device is essentially the same as that of the Hartford suspension. The friction surfaces are enclosed in a dirt-proof and air-tight case and are packed in grease, a feature contributing to perfect action and long life.

VESTAL FRICTION RING DEVICE.

A modification of the foregoing type of friction suspensions is a very simple form

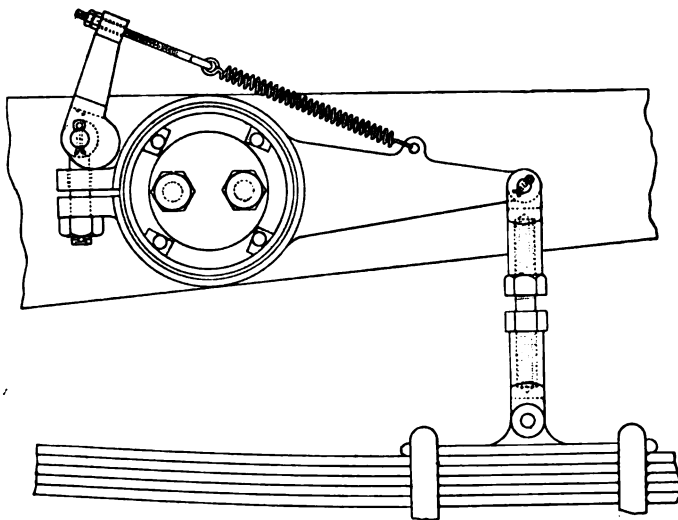


FIG. 4.—KELSEY ROLLER CLUTCH FRICTION DEVICE FOR RESISTING REBOUND.

invented and patented by Oscar E. Vestal, of Pittsburg, and now just being placed in the market. As the accompanying drawings in Fig. 3 show, this has a link 12 movably bolted to a plate 10 secured under the U-shaped spring clips that hold the car spring 8 to the axle 6. At its upper end this link is pivotally bolted to the end of the rocking arm 17, which, at its opposite end, is enlarged into the form of a split ring with lugs. Within the split ring is a drum with a flange 16 and a friction surface. Two bolts 15 secure this drum rigidly to the side frame of the car.

Between the friction face of the drum and the inner face of the split ring is a friction band 19 of leather or other suitable material. Tension on the friction band is maintained by means of a bolt which holds the ends of the split ring together. A block of wood 23 is held between the lugs and may be compressed or replaced by a thin-

ner piece when it becomes necessary to take up wear in the friction band and surfaces. The operation is, of course, obvious, the

friction faces resisting action of the spring in both directions.

KELSEY ROLLER-CLUTCH ABSORBER.

The newest of the shock absorbers designed to offer no resistance to the car spring as it is forced upward, but to prevent the sudden rebound that is so liable to cause the leaves to snap, has been invented and patented recently by C. W. Kelsey, formerly of Philadelphia, but now of Tarrytown, N. Y. The device is illustrated in Fig. 4.

To the side frame of the car is secured by two bolts a circular plate having four cam slots in the periphery. Rollers are inserted in these slots, and bearing on the rollers is a spring steel friction ring split on one side to permit expansion. Between the outer face of this ring and the inner surface of an enclosing ring is a fiber friction band. The exterior ring is split on one

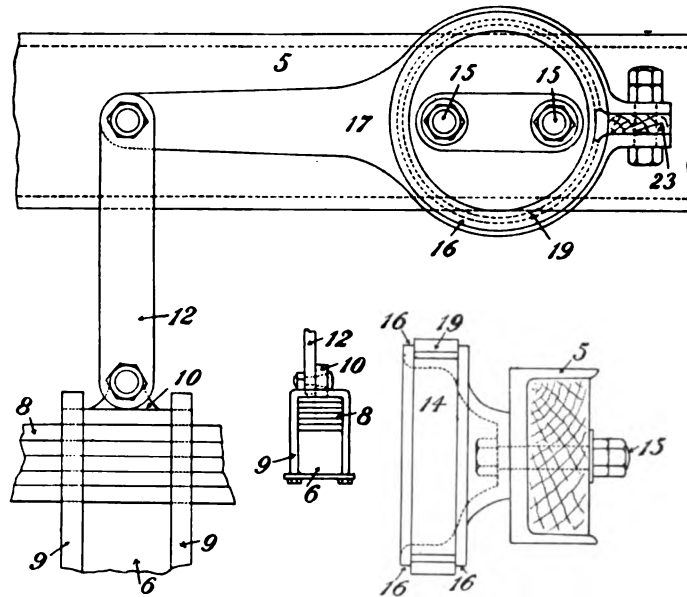


FIG. 3.—DETAIL DRAWINGS OF VESTAL SPLIT-RING FRICTION SHOCK ABSORBER.

side and on the opposite side has a tapered arm which is pivotally connected to the upper end of a link that is in turn pivoted at its lower end to a plate held by the spring clamps of the car.

When the axle and its spring are forced up, the taper arm of the shock absorber rises and the ring at its end is rotated counter-clockwise upon the circular plate attached to the frame. When this movement occurs there is no wedging action in the roller clutch and the spring acts without resistance; but when the rebound occurs and draws the arm down, the rollers are drawn into the small ends of the cam slots and cause the internal split ring to expand within the external ring and set up a frictional resistance.

The amount of friction predetermined by the tension of the coil spring acting on the cam lever pivoted to the head of a bolt which is free in the upper lug of the split external ring. The constant pull of this spring tends to force the ends of the split ring together and bind the ring on the internal friction band. Adjustments are effected by the lock-nut on the end of the

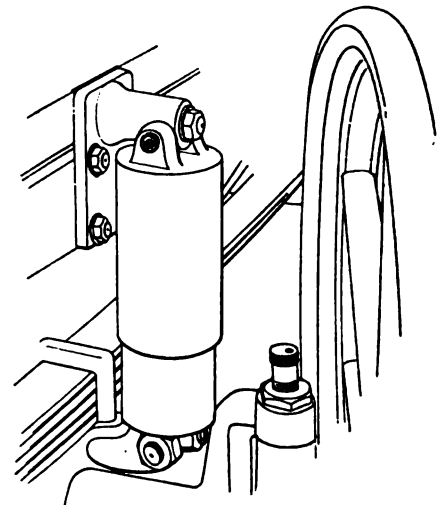


FIG. 5.—KILGORE PNEUMATIC AIR-CUSHION.

eye-bolt and by the right-and-left threaded bolt in the link attached to the car spring.

KILGORE DASH-POT.

Quite a different type of shock absorber from those already described is made by the Kilgore Automobile Air Cushion Company, of Buffalo, N. Y. It consists of a small metal cylinder which is attached to the axle and a piston attached to the frame and working air tight in the cylinder (Fig. 5). Suitable brackets with universal joints are provided for making the connections, so as to permit relative movement in all directions. The stem of the piston or plunger is attached to a casing which fits over the cylinder and excludes dust and dirt. There is no valve in the piston, the elasticity of the inclosed air at either end of the plunger being depended upon to cushion the shock when especially severe jolts compress the spring of the car. The rebound of the spring is also cushioned in the same manner. Sufficient lubricant is inserted in

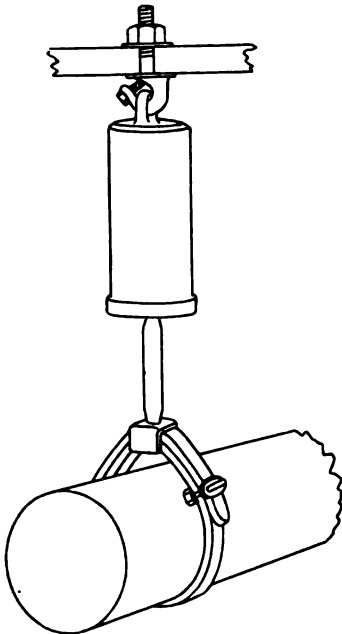


FIG. 6.—HOUSE RECOIL CHECK, UTILIZING FRICTIONAL RESISTANCE ON REBOUND.

the cylinder to last, it is claimed, for 1,000 miles of driving.

HOUSE RECOIL CHECK.

A new device having the form of the air-cushion absorber but utilizing the friction principle is the recoil check invented by H. A. House and now offered in the market by the Baldwin Chain and Manufacturing Company, of Worcester, Mass. This has a cylinder hung from the frame or floor of the car by a hook and eye just above the car axle, as in Fig. 6. Working in this cylinder is a piston divided diametrically and covered with oil-soaked leather to contact with the sides of the cylinder. A rod sliding in the cap of the cylinder is strapped to the axle, and at its upper end is connected to a yoke, to which are attached a set of toggle arms. The ends of the toggle arms abut against the two halves of the divided piston.

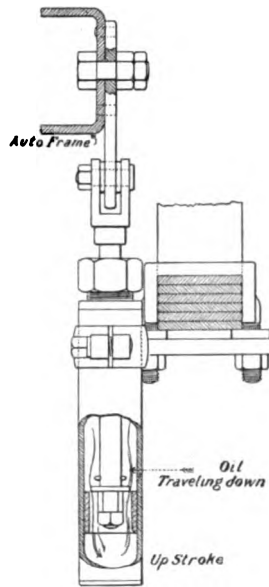


FIG. 7.—FOSTER HYDRAULIC RECOIL CHECK.

Springs in the cylinder normally hold the halves of the piston depressed out of contact with the walls of the cylinder, so that when the axle is forced upward the piston offers no resistance to the motion. But when the spring jerks back, the pull on the plunger stem forces the toggle arms outward and causes the piston to spread out into circular form instead of the normal oval shape, so that the edge contacts forcibly with the walls of the cylinder all around, and the friction cushions the rebound. When the sudden jerk is relieved the valve assumes its normal open position again, ready to check the next jolt.

The construction of the valve and toggle and the tension of the inclosed spring are such that the check offers no resistance to the proper gentle play of the car springs, but acts promptly to check violent action, its resistance increasing as the square of the velocity.

FOSTER HYDRAULIC CHECK.

The principle of hydraulic action is employed in the shock absorber invented and recently placed on the market by the Gabriel Horn Manufacturing Company, of Cleveland, Ohio. As shown in the engraving (Fig. 7), this has a small, light cylinder made of cold drawn steel which is secured to the axle and depends below the spring. Sliding in a guide nut that closes the top of this cylinder is a plunger rod connected to the side frame of the car by means of a bolt. At the lower end of the plunger rod is a head having two small valves. The bottom of the cylinder is filled with oil.

Sudden compression of the springs forces the plunger down against the oil and the oil is forced quickly through the valves to the upper side of the plunger. When the recoil occurs the oil in the upper chamber acts as a cushion and the plunger retards the spring action with a slow, steady pull that prevents the jar and shock occasioned by a bump encountered at high speed, the oil flowing back slowly to the lower cham-

ber in readiness for the next jolt. The device is adjustable in every direction and can be placed on any car. It is built substantially and weighs 2 1-2 pounds.

SHEDDAN PNEUMATIC CUSHION.

Air inclosed within a cylinder is the cushioning agent depended upon by the Sheddman Manufacturing Company, of Baltimore, Md., in its Perfection air cushion which is being offered to automobilists. While this device has the same general appearance as the Foster absorber, the position of the parts is reversed, the cylinder being attached to the side frame, as shown in Fig. 8, and the plunger rod to the spring and axle. The pneumatic cushions above and below the piston absorb the shocks in both directions, like the Kilgore device, reducing the effect of the severer shocks due to high speed on rough roads. The device is adjustable to any depth of springs by means of the bracket sleeve which is bolted to the side frame of the car.

EDO SPRING COMPENSATOR.

The shock absorbed offered by the Edo Spring Compensator Company, of New York, consists of a worm-gear rod, having at one end a small cone with a washer of leather interposed between its face and a metal surface to provide a braking effort when the rod is revolved in the reaction of the springs. This rod passes through a suitably threaded box attached to the axle of the car, a grease cup fitted to the box providing proper lubrication for the worm rod and the threaded guide. The mechanism is protected from dust and dirt by a corrugated leather jacket which extends to the lower end of the rod and between the two cylindrical boxes on the axle and frame. The cylindrical box attached to the frame is so designed internally that the

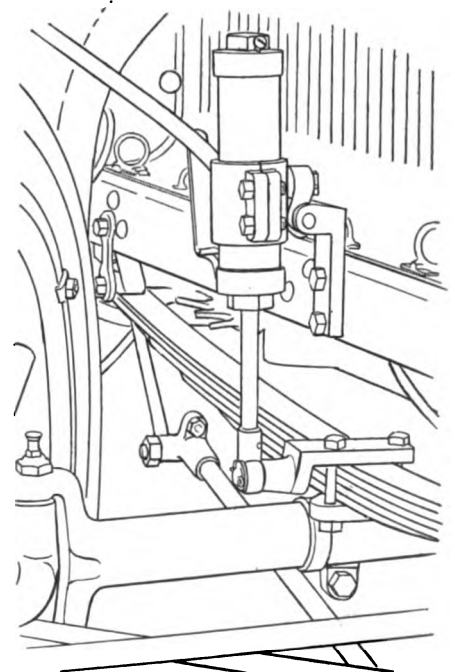


FIG. 8.—THE SHEDDAN PNEUMATIC SHOCK ABSORBER.

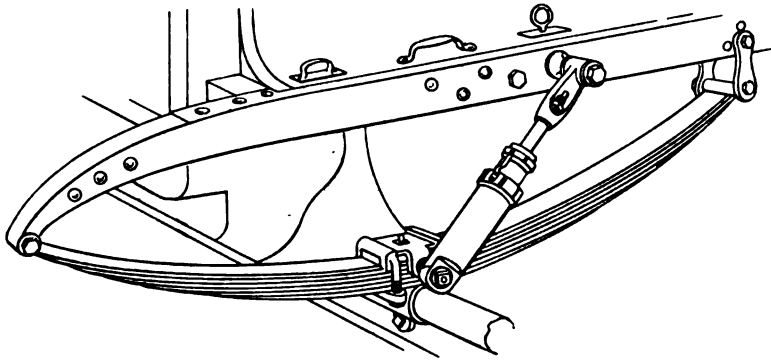


FIG. 9.—AMERICAN HYDRAULIC SHOCK ABSORBER.

worm rod has a free bearing when the springs are compressed, the cone clutch being brought into action only when the reaction occurs, and in proportion to the severity of the rebound. Both boxes are attached to the car with universal joints so that side swing of the frame on rough roads will not interfere with the free action of the device. The retarding effect is gradually decreased as the springs assume the normal position and the absorber is claimed to act without causing the slightest diminution of the sensitive action of the springs in compression.

HOTCHKIN ANTI-JOLT DEVICE.

A shock absorber devised on the hydraulic principle with one-way action is marketed by P. M. Hotchkin, of Chicago. The circular case containing the simple mechanism may be bolted either to the axle or to the frame, see Fig. 11, showing the latter method of attachment.

The mechanism inside the case consists of a central shaft to which is attached a wing or paddle that forces the contained liquid, glycerine, ahead of it in either direction as the paddle is carried around by the action of a reciprocating arm which is attached to the frame by means of a hinged link and a stud. The one-way action is ob-

tained by the use of a check valve fitted to one side of the case, the glycerine pass-

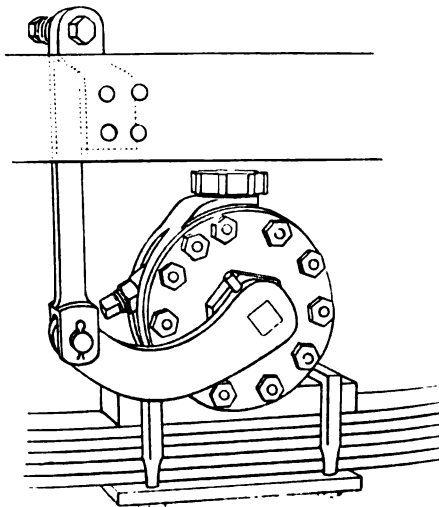


FIG. 11.—HOTCHKIN SHOCK ELIMINATOR.

ing freely through the open valve when the revolution is caused in the direction of spring compression and the check valve decreasing the size of the passage when the direction is reversed and the axle and frame are moving apart. By thus restricting the passage for the liquid the rebound or pitching of the body is prevented.

SAGER EQUALIZING SPRING.

The J. H. Sager Company, of Rochester, N. Y., manufactures a spring designed to contribute to the easy riding qualities of a car, acting as a shock absorber when applied as illustrated in Fig. 12. This device is really a supplemental spring, acting in both directions and is so designed that the small coils at the ends of the spring will come into action after compression or extension of the larger diameter, mid-section has been accomplished.

There are no moving parts to compensate for side swing, the flexibility of the spring taking care of any lateral motion of the car frame when driving at high rates of speed or over rough roads. Among the advantages of the Sager spring is the low cost, simplicity and ease of attachment.

AMERICAN SHOCK ABSORBER.

A two-way hydraulic check is made by the American Shock Absorber Company,

Easton, Pa., which is designed for attachment at an angle of 45 degrees from the vertical. This method of attachment is claimed to not only admit of the use of a shorter cylinder and piston but to contribute materially to the good results of spring control. (See Fig. 9.)

The barrel is made of cast bronze, in one piece, with the eye for attachment to the axle formed in an integral extension at the bottom of the closed cylinder. The open upper end is threaded to receive the cover cap, which is provided with a threaded extension to carry the stuffing box and retaining cap and a locking ring. The piston is machined from a solid bar, the rod being integral and threaded at its upper extremity for the attachment of the eye which takes a stud, riveted or bolted to the frame of the car.

The device is dependent for its action on the travel of the piston up and down the cylinder through a body of oil, the oil finding a passage through the piston by way of an adjustable valve. The valve is adjustable by means of a threaded steel rod of small diameter extending through the piston rod and terminating in a square head with suitable lock nut for securing it in position, the adjustment being necessary only when the shock absorbers are first fitted to a car. This feature admits of the use of but one model for light, medium and heavy cars.

The check is placed with the pistons of the front pair inclining toward the rear and the pair for the rear axle are inclined

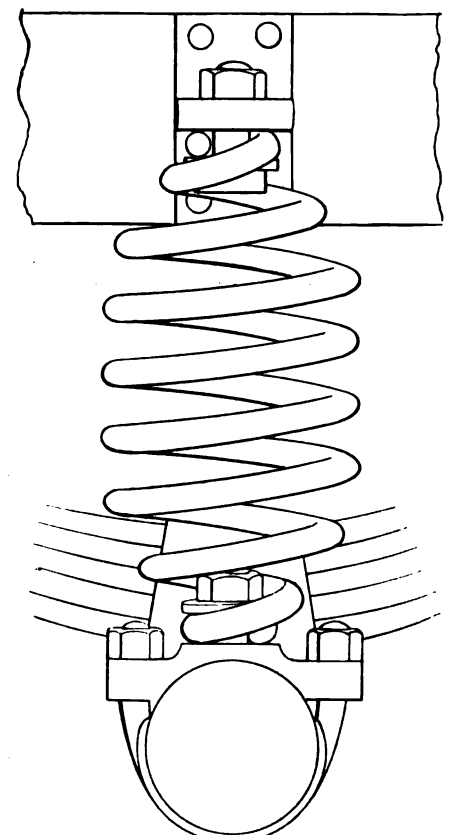


FIG. 12.—SAGER EQUALIZING SPRING.

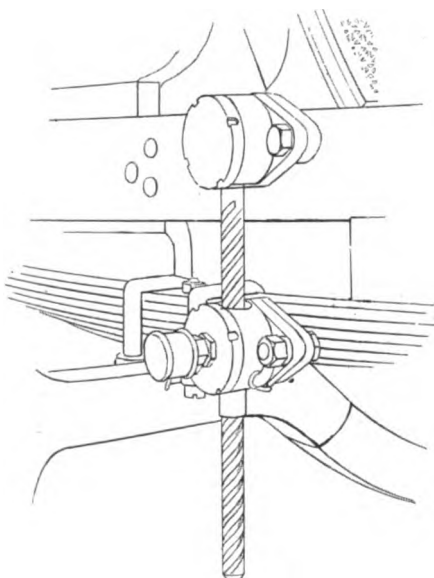


FIG. 10.—EDO CONE CLUTCH CHECK, ACTING ONLY ON REBOUND OF SPRINGS.

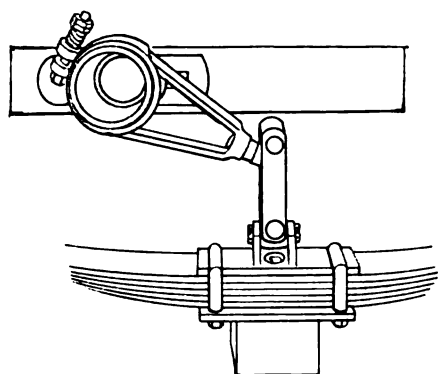


FIG. 13.—GODSHALK UNIVERSAL SHOCK ABSORBER.

forward. In order to provide for lateral motion of the frame the attaching eyes are countersunk with a decided taper and cup-shaped caps are fitted to retain conical rubber washers in contact with the studs on the frame and axle.

GODSHALK UNIVERSAL SHOCK ABSORBER.

A shock absorber depending on frictional resistance is made by E. H. Godshalk & Company, of Philadelphia. A friction drum is attached to the frame of the car with a steel spring collar, a band of oak tanned leather being interposed to provide a gripping surface. The arm of the spring constricting member is attached to a link by means of a universal joint, a second universal joint being located at the lower extremity of the link to provide free motion to the device when the frame of the car is thrown out of alignment with the wheels on rough roads.

The friction drum is self-adjusting to the required amount of tension and exerts a retarding effect both under compression and rebound of the springs of the car.

Road Waterproofing Process.

KANSAS CITY, Feb. 3.—It is universally admitted that the most perfect road for the greatest variety of uses is a dirt road, packed solid enough to do away with most of the dust and yet having enough resiliency to make traveling easy for animal and vehicle. In a number of places in Kansas, notably in the vicinity of the State Agricultural College, this idea has been developed and frequent experiments have been made with roads treated by oil under several different processes.

The most successful tests along this line, however, have been made in Kansas City by a local concern, the Imperial Roadway Company. One piece of pavement laid by this company on Fortieth street between Troost and Harrison streets, has seen the hardest kind of service for three years and has outlasted the roadway adjoining it on both sides. Another piece has been down since last summer and is giving much better satisfaction than a strip of asphalt adjoining it. Neither the heat of the summer nor the frosts of the winter has affected

the pavement, and constant travel over it has given ample opportunity for observing the results of heavy traffic.

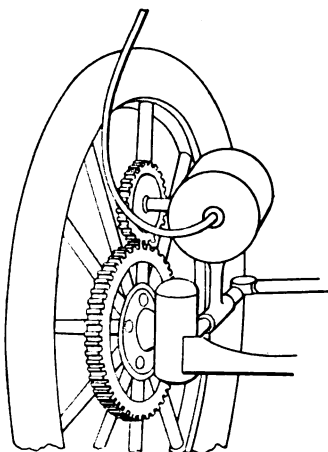
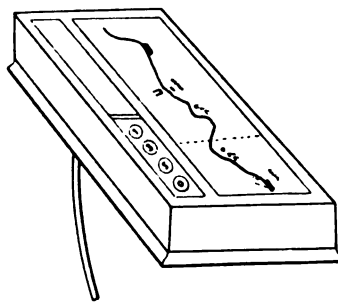
The cost of this new pavement is less than that of good macadam, while its wearing qualities are said, and appear, to be better. The pavement is simply a water-proofed dirt road—nothing more.

While the Imperial Pavement is laid under a secret and patented process, enough is known to give a fair idea of it. To begin with, the road is graded to the level which it is to have when finished. The earth is then harrowed fine to a depth of several inches and saturated with a patented mixture, of which crude oil is the principal constituent. This treatment is kept up until all the harrowed earth is a sticky, oily mass, thoroughly impregnated with the oil.

After that the whole mass is rolled hard. A little cement is applied to the top to give a light color, as otherwise the pavement would be black. The surface, after the rolling has been finished, is not smooth like asphalt. It looks as if a very thin layer of sand had been sprinkled upon it, and there is never a time when an automobile tire cannot get traction on this surface.

A piece of country road ten miles long is under contract and probably will be laid in the spring. The cost is seventy-five cents a square yard to the property owners, as against \$2.50 for asphalt. The road has been seen and approved by some of the most prominent good roads advocates in the United States.

Another unusual feature of the "water-



AUTOMATICALLY UNFOLDED MAP.

proofed" road is that it does not get muddy, even if soil is tracked on it by wagon wheels. Why this is so is yet to be explained, but muddy weather tests have proved the truth of the statement.

So widespread is the interest in the new process that a number of agencies for different states have been placed, some of the territory assigned being east of the Mississippi river. The prospects are that a good deal of such pavement will be laid before next winter. One valuable feature, so far as country roads are concerned, is that no plant is necessary for the preparation of the material, thus reducing the required capital to a minimum.

Novel Auto Map.

A new automobile map has been brought out in Paris which will constantly indicate to the driver his position on the road and will roll out before him automatically in proportion to his speed. The apparatus consists of a glass-top box about 8 inches long and 3 inches wide attached to the top of the dash. On the right-hand side is exposed a strip map of the road supported on a roller at each extremity and made to unroll at a rate proportionate to the speed of the car, but always in such a way that 5 miles of the road ahead can be seen. On the left-hand side of the road map is a narrow strip giving an explanation of all the signs shown on the map. At a speed of 37 miles an hour every obstacle or change in the nature of the road is known 8 minutes before it is reached. At 74 miles an hour, the same would be indicated 4 minutes in advance. The map is made to unroll by means of gearing on the front wheel of the car, imparting motion to a gear on the chart box by means of a flexible cable exactly as is used for speedometers. When passing through towns the map indicates, left, right, so that it is possible to go right through without stopping to ask directions.

Akron, Ohio, famous for its automobile tire factories, has 165 licensed automobiles, but with all of its great output of tires, it has no automobile factory. The ordinance requiring the licensing of automobiles went into effect in June, 1903, and the first license was taken out by Chief of Police Durkin for the auto police patrol, said to be the first of its kind in the United States, and which is still in use. Since the licensing of automobiles began, two women have been authorized to operate machines. In 1905 seventy automobiles were sold in Akron, and dealers predict a much larger sale this year. Most of the machines which have already been purchased, or will be purchased during the next two weeks, will be on exhibition at the Cleveland show from February 16 to 24, and then be delivered later.

The present winter (?) has been a very poor one for demonstrating the practicability of suggestions given for the handling of automobiles in cold weather.

Advance Work for the Grand Prix.

PARIS, Jan. 22.—The authorities in the Sarthe district, through which the French Grand Prix will be run, are enthusiastic over the great race, and their aid is assured. A local automobile club has just been formed which will give valuable assistance to the Automobile Club of France. Among the rural inhabitants there is a very friendly feeling toward automobilism, despite an unfortunate habit that the country people have of allowing their cattle and fowl to stray on the road, neglecting to light their lanterns and ignoring the rules of the road. In order that the entire population may be made acquainted with the importance of the race, a local committee, acting in conjunction with the Automobile Club of France, has arranged to give lectures in every village on the Sarthe circuit on automobilism in general and the big race in particular.

Cinematograph pictures of the last Gordon Bennett race will be shown, the national importance of the automobile industry will be dealt with, the advantages to be derived from automobile transport services in country districts will be pointed out, the immediate financial gain to the neighborhood, and instructions to drivers and farmers on how to act when meeting an automobile will also be given.

As most of these villages are excessively dull in winter, a free moving-picture exhibition and lecture will be quite an event; it is thus reasonable to presume that all the little prejudices on the part of country folk against automobilists will be removed in advance, and that when the racing teams arrive on the spot they will find an enthusiastic population to greet them.

Work on the circuit will not be commenced until winter is quite over. Very few changes have to be made, the road being already in such perfect condition. The erection of grandstands and the making of two loop roads will be quickly accomplished when fine weather arrives. A meeting of the Sporting Commission will be held in a few days, when it is expected that the exact date of the race will be fixed.

In addition to Fiat, Itala and Isotta Fraschini cars, already announced as representing Italy in the Grand Prix, two other Italian firms have declared their intention of starting in the race. They are Züst and the new firm, F. L. A. G. (Fabbrica Ligure Automobili Genova). Raggio, the winner of the Florio Cup last year, will drive the F. L. A. G. racer.

Three 120-horsepower Züst machines are now under construction. They will have four cylinders, four speeds and reverse with direct drive on the high, and on the high speed the road wheels will make the same number of revolutions per minute as the motor flywheel.

The Mors concern has officially declared that it will not take part in the race. Two

new French firms which have not hitherto competed in big road races, but which have created a very favorable impression in tourist competitions, have decided to build racers. They are Vulpes, with two machines, one of which will be driven by Barriaux, and Grégoire, also with two machines.

European Circuit Plans.

PARIS, Jan. 26.—Some important modifications have been made in the regulations governing the 3,100-mile touring test through Europe this year. For every stop during the run one penalty point will be counted for each minute; stops for tire troubles will not be penalized. In order to limit the speed of machines, the running time of each competitor will be augmented by the total penalized stops and non-penalized stops for tire repairs. In addition one penalty point per minute will be imposed for failure to keep up to the minimum speed indicated for each category.

A map of the entire circuit and list of regulations will be drawn up in the French language and given to each competitor; but should they wish to do so, foreign clubs whose territory is passed through may issue special maps of their own portion of the circuit. Every competitor finishing the tour will be presented with a diploma in the names of the Automobile Clubs of France, Germany, Austria, Belgium and Italy.

Twenty-one days will be occupied by the European tour, six of them being given up to exhibitors in the principal centers passed through. Following is the complete list of towns passed through, together with dates: July.

29. Paris, Limoges.
30. Limoges, Toulouse.
31. Exhibition at Toulouse.

August.

1. Toulouse, Le Puy.
2. Le Puy, Aix-les-Bains.
3. Exhibition at Aix-les-Bains.
4. Aix-les-Bains, Milan.
5. Exhibition at Milan.
6. Milan, Trieste.
7. Trieste, Klagenfurth.
8. Klagenfurth, Vienna.
9. Exhibition at Vienna.
10. Vienna, Prague.
11. Prague, Breslau.
12. Breslau, Berlin.
13. Exhibition at Berlin.
14. Berlin, Hanover.
15. Hanover, Cologne.
16. Exhibition at Cologne.
17. Cologne, Mezières.
18. Mezières, Paris.

The executive committee for this event consists of one member from each of the automobile clubs engaged in the tour, with Marquis de Dion as president. Local organizations will be left to each of the clubs through whose country the competitors

have to pass. Entries for the tour can be made to any national automobile club, and must be given in by April 15, after which date double entrance fees will be charged.

The number of starters has been fixed at 130; should this number be exceeded, the executive committee will annul a sufficient number of engagements to reduce the total to 130, beginning with the entries last received. Entrance fees will, of course, be refunded in full.

EXPORTS AND IMPORTS IN 1905.

The official record of our trade in automobiles and parts with foreign countries during the year just closed has just been published. It shows a remarkable growth of American exports, which have increased from \$1,643,029 in 1903 and \$1,897,510 in 1904 to \$2,695,655 in 1905.

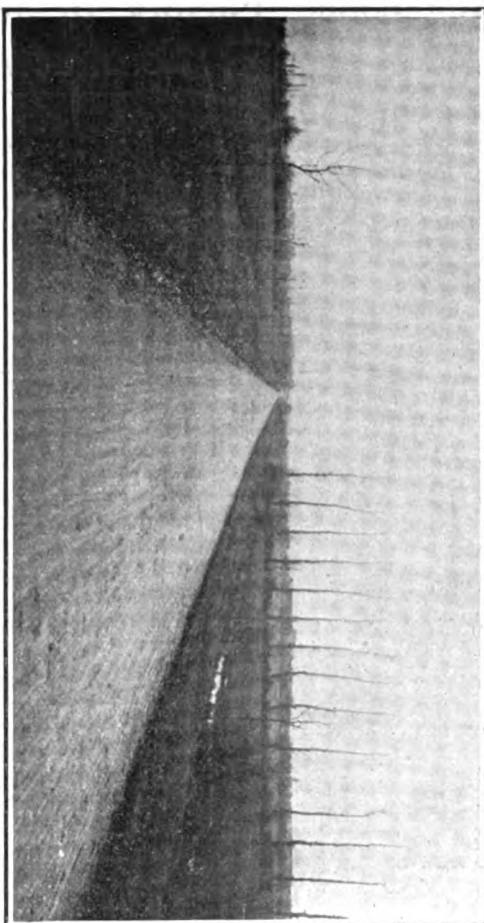
As compared with these figures the imports of automobiles and parts for last year aggregated \$2,002,459, of which amount \$1,866,402 represents the value of the 496 machines imported. During the month of December last forty-five cars, valued at \$169,376, were brought in and \$29,730 worth of parts were admitted.

Following is the record of exports from the United States by countries for December, 1905, and for the twelve months ending with December:

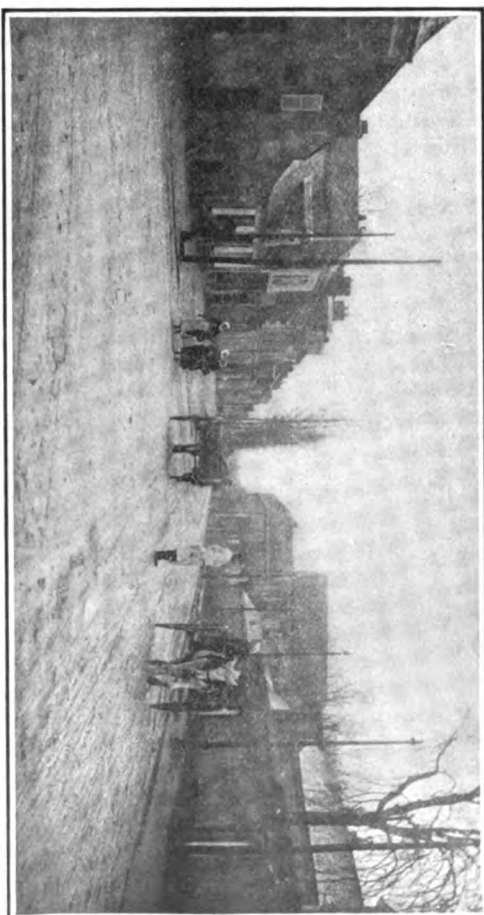
Exported to—	Dec., 1905.	Twelve Mos. Ending Dec., 1905.
United Kingdom.....	\$ 75,258	\$ 707,045
France	7,645	269,703
Germany	1,651	105,457
Italy	4,073	163,978
Other Europe.....	1,477	239,379
British North America..	23,827	537,588
Mexico	29,672	192,452
West Indies and Bermuda	20,498	151,859
South America.....	5,507	61,419
British East Indies.....	696	31,793
British Australasia.....	8,964	120,083
Other Asia and Oceania.	2,699	63,577
Africa	5,760	39,288
Other countries.....	8,918	12,034
Total.....	\$196,645	\$2,695,655

England will be well represented at the Monaco auto boat races next April, five of the fourteen entries in the eight to twelve meter class being British; namely, *Yarrow Napier*, entered by S. F. Edge; *Siola*, entered by Lionel de Rothschild (Napier engine); *Brooke I*, entered by Mawdeslay Brooke (Brooke engine); *Hutton II*, entered by J. E. Hutton (Hutton engine); *Hutton-Saunders*, entered by A. Cunliffe (Mercedes engine). In the cruising division Miall Green starts his successful *Takumono* in the 6 1-2 meter class, and Mr. Gorham his *Quicksilver*, a Daimler-engined hull, in the 8 to 12 meters.

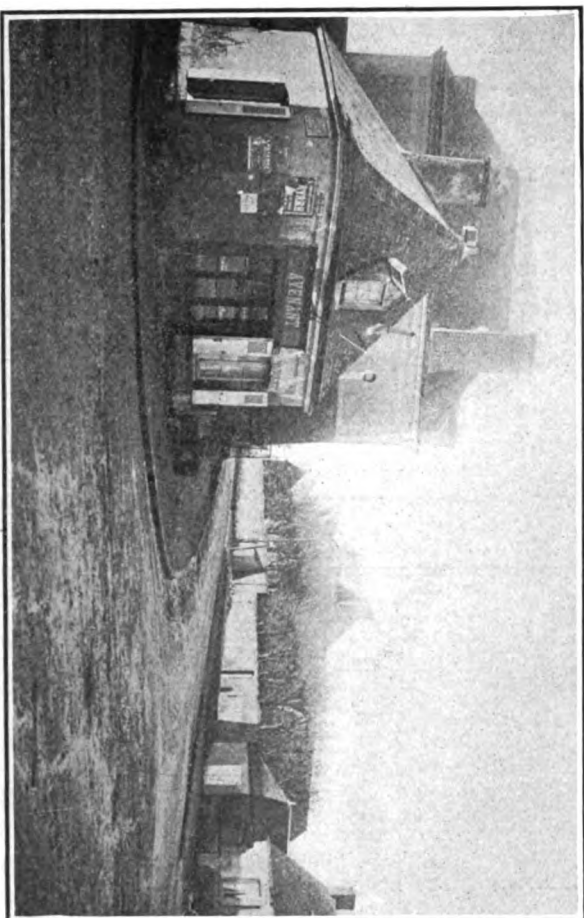
It seems impossible to make some people understand that the driver of an automobile actually dislikes running down a pedestrian, a dog, or even a hen.



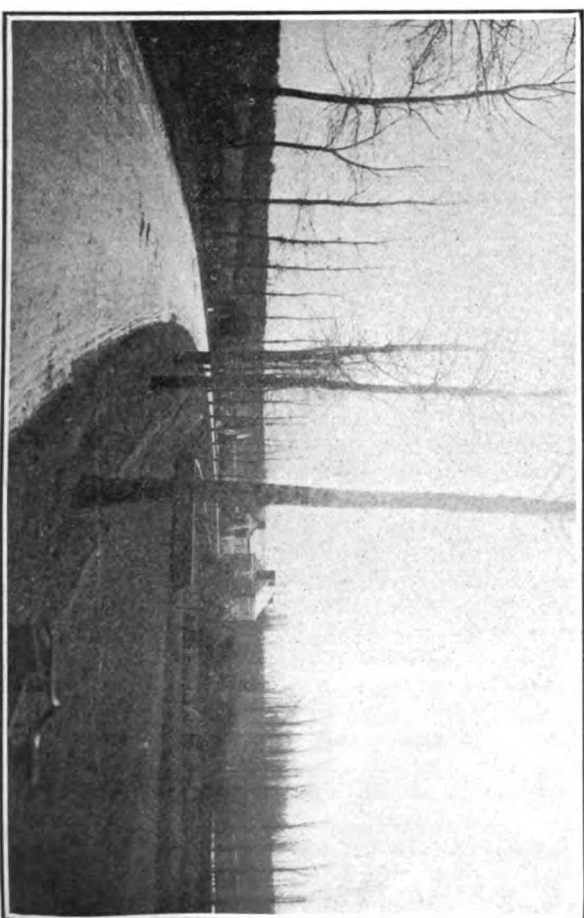
MAGNIFICENT STRAIGHT STRETCH APPROACHING SCAUX BY THE HUISNE RIVER, ON THE NORTH LEG OF THE COURSE.



TURN NEAR MANS AT WEST ANGLE OF COURSE LOOKING IN THE DIRECTION OF SAINT CALAIS, AT THE EAST ANGLE.



DANGEROUS TURN IN CORNER ON NORTH LEG OF THE TRIANGLE, SHOWING NARROW STREETS AND RISING GRADE.



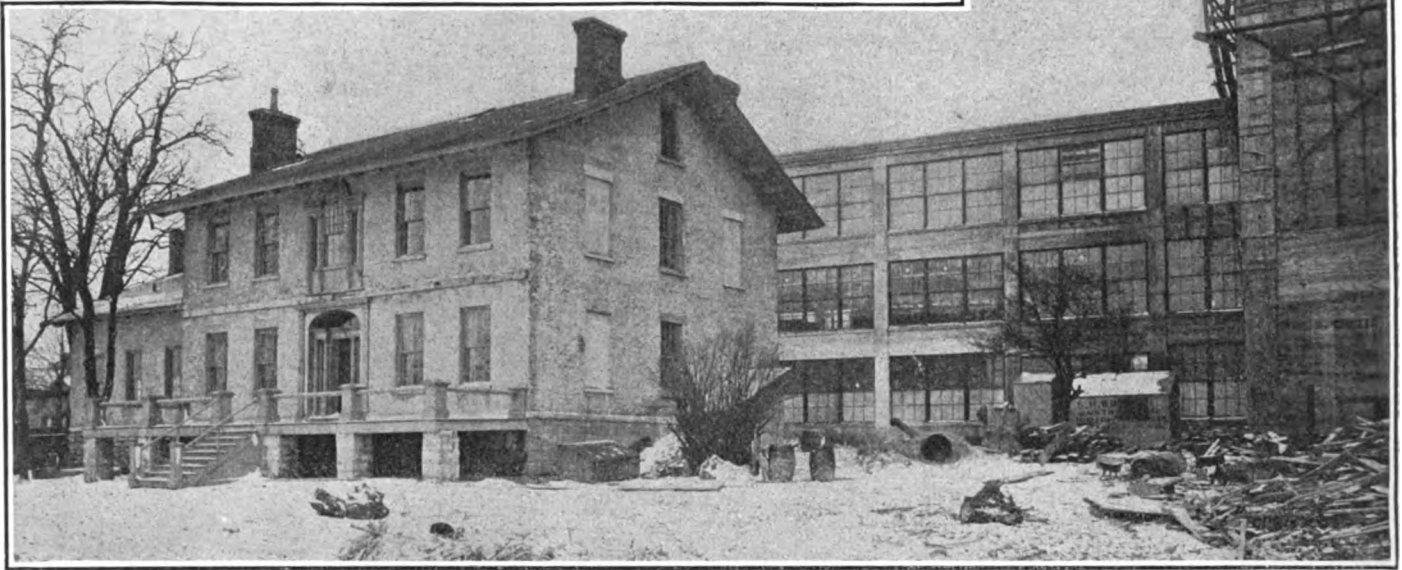
FINE SWEEP OF EMBANKED ROAD CURVING IN THE DIRECTION OF ARDENAY ON SOUTH LEG OF THE COURSE.

CHARACTERISTIC VIEWS OF THE NEW COURSE JUST SELECTED FOR THE FRENCH GRAND PRIX AUTOMOBILE RACE, NEAR LE MANS, IN THE DEPARTMENT OF SARTHE, FRANCE

Automobile Factory of Monolithic Concrete Construction.

THE demand for a factory building that would be as nearly fireproof as possible with stability under the trying condition caused by machinery in motion, and at the same time possible of erection within a

concrete is poured in and tamped down, so that when the mass has "set" or hardened, the work forms a monolithic mass. Particular attention was given the composition of the concrete and the disposition of the



FRONT VIEW OF NEW THOMAS AUTOMOBILE FACTORY IN BUFFALO, SHOWING BOARD MOLD ON TOWER AT RIGHT FOR FORMING CONCRETE WALLS AND HISTORIC OLD MANSION IN CENTER REMODELED INSIDE FOR USE AS AN OFFICE.

brief time, led to the adoption of cement construction of the new buildings now almost completed for the E. R. Thomas Motor Co., of Buffalo.

Although the form of concrete construction followed by the builders is well known in railroad practice, bridge and viaduct abutments being now generally built of concrete on this plan, the use of this material for an automobile factory is a novelty in America. Instead of erecting a steel framework to support the side walls, roof, and contents of the building, steel has been used only as supplementary to the concrete, the walls, floors, beams, and other members of the structure being virtually one solid piece, stiffened with imbedded metal tie-rods. The resultant work is practically a one-piece building with stiff and unyielding floors, insensible to the vibrations common to wood floors of even the heaviest construction. No wood is used in the construction except for the window and door sashes, and the wooden supports for the shafting, which are bolted directly to the iron rods buried in the concrete at the time the building was erected. A few other small strips of wood are used as supports for the electric light wiring, but wood has been uniformly displaced wherever possible throughout the plant.

The method of building up the side walls is clearly indicated in the view of the water tower, partially finished when the photograph was made. Boards and scantlings are erected in the form of a mold, and the

tie-rods, so that the building will withstand the tensile strains incident to the use of heavy machinery.

The new plant is shaped like an irregular L. One wing is 190 feet long and the other is 195 feet, with a width of 50 feet each. There are three stories and a basement, with a five-story water tower at an angle of the wings. The tower will have sufficient water capacity to supply the building and a complete equipment of automatic sprinklers and other emergency fire protection.

In planning the structure, particularly ample window spaces were provided, so that an abundance of light is available for the various operations of automobile construction. In all there are 496 windows, with more than 16,000 square feet of glass, which, with the white interior walls, should afford exceptionally fine light throughout the plant.

The building is so arranged that from the machining room the component parts of cars are carried direct to and about the assembling department by traveling cranes. The track for the cranes is shown in the illustration of the interior of the factory, and this overhead "trolley" will greatly facilitate the handling of all heavy parts. After assembly the motors and transmissions are carried by a traveling crane to the main assembling room, where the chassis construction is completed. The road tests are made before the bodies are fitted, and when this important work has been satis-

factorily performed the chassis are taken by elevator to the second floor to receive the finished body and the final touches before shipment. The body finishing department is located on the third floor, which with its abundance of light affords opportunity for the most careful work and the closest inspection.

The entire available factory space is not yet in use, but when fully taken up will provide a capacity of no less than 1,200 standard Thomas touring cars a year.

The executive offices of the company are located in the historical residence building shown in the exterior view. This interesting old mansion was erected in 1816 by General Peter B. Porter. It is one of the oldest existing houses in Buffalo and is in a fine state of preservation. The company has found it necessary to remodel the interior of the building, but the charming entrance doorway and the fine Palladian window have been carefully restored, and will long afford inspiration for the student of early American architecture.

Lead Bottle Ignition Battery.

Storage batteries, or "accumulators," are used for ignition work in foreign countries almost to the exclusion of other batteries, and the American automobile shows have indicated that the storage battery is rapidly gaining ground in this country.

Manufacturers are devoting a great deal more attention to this apparatus than for-

merly, and new and improved forms are being brought out. One of the latest is the "lead bottle" storage battery, placed on the market by the Dayton Electrical Mfg. Co., of Dayton, O., manufacturers of the Apple ignition dynamo.

The main feature of the bottle battery is its simplicity. Each cell consists of but two elements, a positive and a negative; the bottle itself, of lead, forms the negative element, and is grooved to take the active material, the grooves being of dovetail form to retain the composition. Rectangular perforations are formed in the positive plate to take the active material. There is but one plate in the cell, which makes the problem of securing it against movement a comparatively simple one. At the point where the connection from the positive plate projects from the bottle there is a rubber bushing which exactly fits the space, holding the plate in position and at the same time sealing the cell against leakage. A vent pipe carries fumes out and discharges them downward, where they can do no harm to connections or other metal fittings; a filling opening is provided, with a rubber cork to keep it tight.

Each cell has a capacity of 30 ampere hours at 2 volts, and any desired voltage is obtained by using the necessary number of cells. Rubber separators are placed around each cell, and others between the cells; the desired number of cells is placed in a metal case with a hard rubber bottom, and the empty space around the cells is filled with an insulating material, melted, poured in,

and allowed to harden. All connections except the two main terminals are covered and sealed, and the whole battery thoroughly protected by this method. The filling openings are, of course, not sealed.

Smooth metal cases are used for the batteries; these cases can be slipped into wood boxes and may be snugly fitted, there being no protuberances or irregularities.

Connections between the units of each battery are of lead and are soldered; the joints are thus permanent, especially since they are embedded in the sealing material with which the case is filled.

According to the statements of the manufacturers, the lead bottle storage battery is lighter and smaller than a storage battery of the usual form of equal efficiency and output.

SHUGERS TAKE-DOWN RIM.

A detachable rim to fit the standard type of clincher tire has been patented by George Shugers, of Auburn, Ind., and it is understood that a tire manufacturer contemplates putting the rim in the market at an early date.

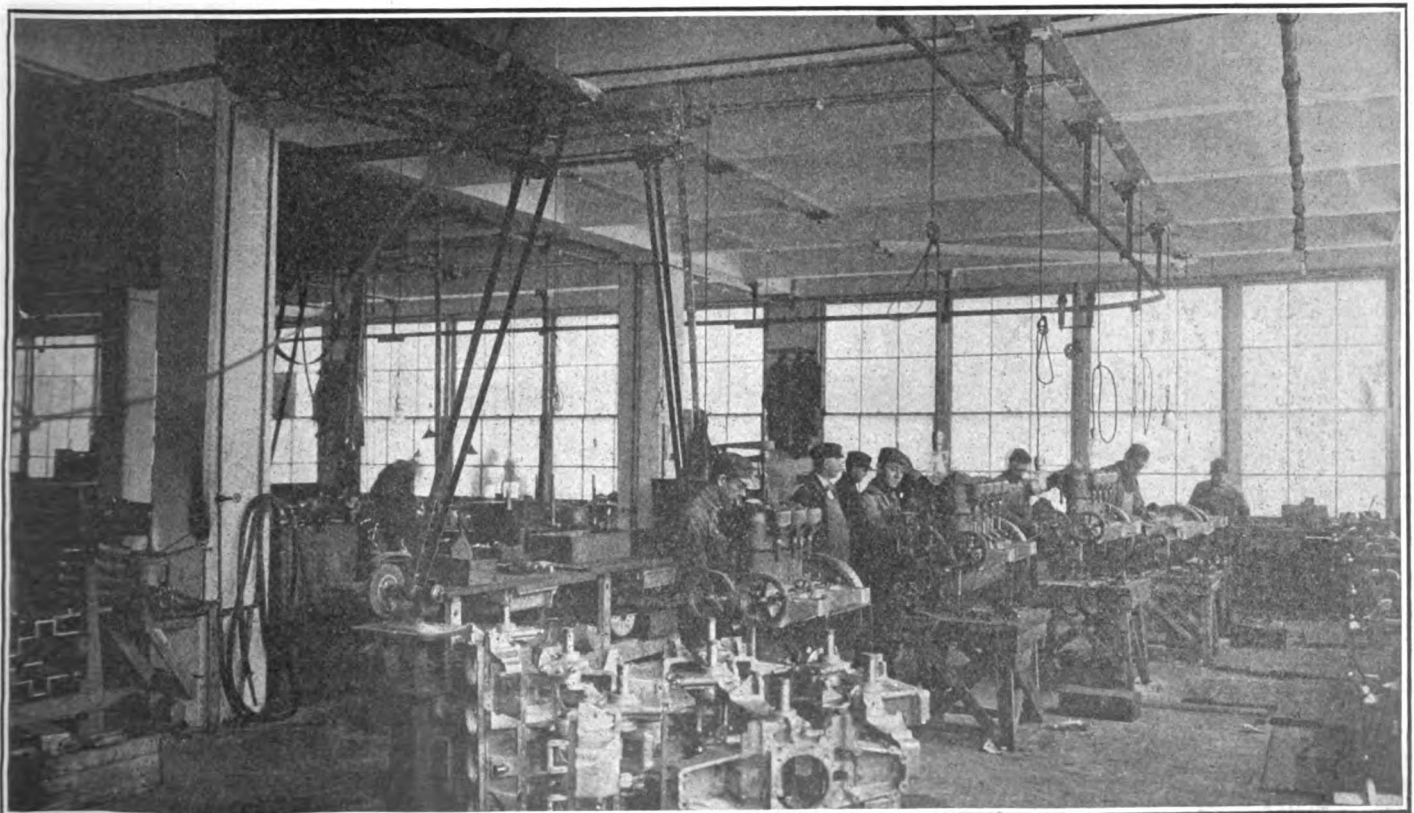
The permanently attached member of the metal rim is provided on one outer edge with a beading which is formed with a square faced seat to receive a detachable ring. This ring has two lugs, securely riveted and brazed on, designed for engagement with a hinged latch which is attached to the bead on the attached member of the rim. Although the rim is securely held together by means of the latch,

inflation of the tire materially contributes to the security of the device.

It is claimed that in practical use a tire may be removed from the rim in eight seconds and replaced without the use of special tools. There are no loose pieces, and the entire device consists of but three parts—the permanent and detachable rim members and the latch.

RECENT LITERATURE.

A comprehensive special automobile number has recently been issued by the *Scientific Australian*, a quarterly publication printed in Melbourne and devoted to the arts and industries. The number is replete with the news and progress of the automobile world in the Antipodes and presents to readers a dissertation on the status of the self-propelled vehicle in that far-away continent. It is noticeable that several American cars are represented in the advertising columns of the number, and naturally a number of machines of English manufacture. The automobile is given a prominent place in the text pages and an article states that power boats and speed launches to the value of more than \$375,000 are in commission in the harbor of Sydney. Although the roads of southern Australia are extensive, the quality of the main highways is discouraging to the rapid growth of the automobile industry. Nevertheless, the most optimistic view is taken of the future of the automobile and motorcycle in Australia, and manufacturers of complete cars, tires and sundries are looking to that market for a considerable outlet for their product.



SECTION OF INTERIOR OF THOMAS FACTORY, SHOWING ENGINE ASSEMBLING DEPARTMENT, WITH OVERHEAD TROLLEY FOR TRAVELING CRANE USED IN MOVING HEAVY CASTINGS.

Kirkham Motors.

A line of automobile motors ranging from 12 to 24 horsepower, in three, four and six-cylinder types and several air-cooled engines for motorcycle equipment, comprise the 1906 product of the Kirkham Motor Mfg. Co., of Bath, N. Y. In addition, the company manufactures change-speed mechanisms and clutches suitable for assembly with the motors and transmissions.

The 18-22-horsepower motor may be taken as typical of the line, the various other models being designed along similar lines with such changes and amplifications as necessary to provide other powers. The vertical four-cylinder water-cooled motor has interchangeable inlet and exhaust valves arranged side by side on the right-hand side. The bore and stroke are equal, 3.3-4 inches, and the motors are tested to give not less than 26 brake horsepower before shipment. The weight of the engine with flywheel is 265 pounds.

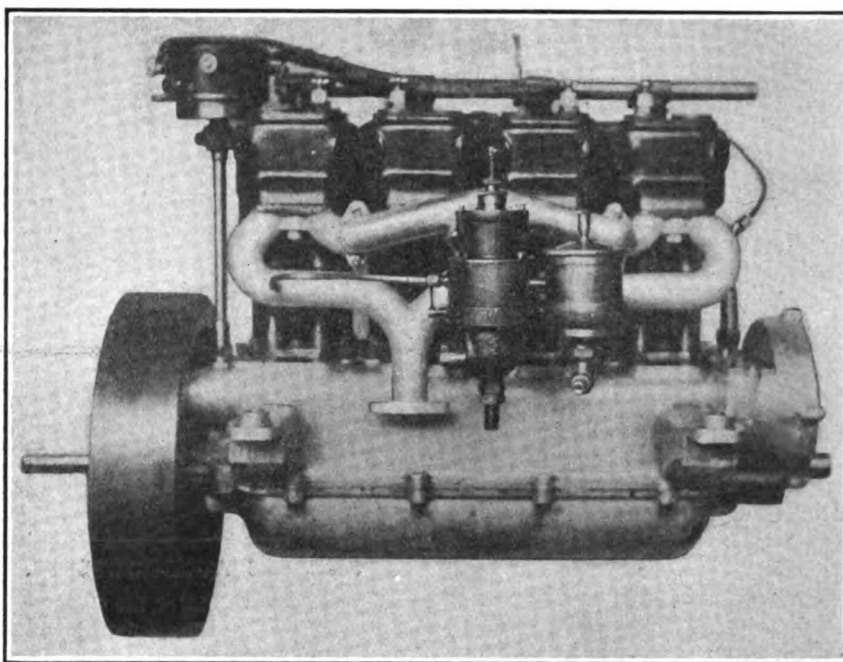
The cylinders are individual, with integrally cast water jackets and valve chambers, the latter of small dimensions with valves set close to the cylinders, giving an approximately cylindrical combustion chamber. Bores, also pistons and rings, are given their final finish by grinding. The connecting rods are drop forged with Parsons' white bronze bearings at the lower ends, while the upper ends are fitted to hardened tool-steel piston pins which are journaled in the piston bosses instead of in the connecting rods as usual, materially increasing the length of the pin bearings.

The five bearings for the hardened and ground crankshaft are fastened to the upper half of the crankcase by long, special steel bolts extending through to the top of the case, thereby relieving the aluminum casting from the strains from explosion. The bearings are phosphor bronze lined with Parsons' white bronze bushings, sweated in and hand-scraped to a fit.

The camshaft assembly is built up of

hardened and ground steel shaft and case hardened cams, fitted with Woodruff keys and taper pins milled to exact size. Drive is through a steel gear on the engine shaft, driving a phosphor bronze and fiber gear on the camshaft, providing a smooth and noiseless transmission. All gears are housed in aluminum casings which are an oil-tight fit.

Ignition is through a combined timer and distributor, located back of the rear cylinder and driven by a vertical shaft actuated by a spiral gear on the camshaft, the gears being enclosed in an oil-tight housing. Motors are furnished complete with automatic carbureter, inlet and exhaust piping, spark plugs, combined timer and distributor, pressure oiler and water pump and piping. The location of the pump is at the front of the motor with drive through a cross shaft and bevel gears from the forward end of the camshaft.



KIRKHAM MOTOR WITH INDIVIDUAL CYLINDERS AND VALVES ALL ON RIGHT SIDE.

Cylinder Boring Lathe.

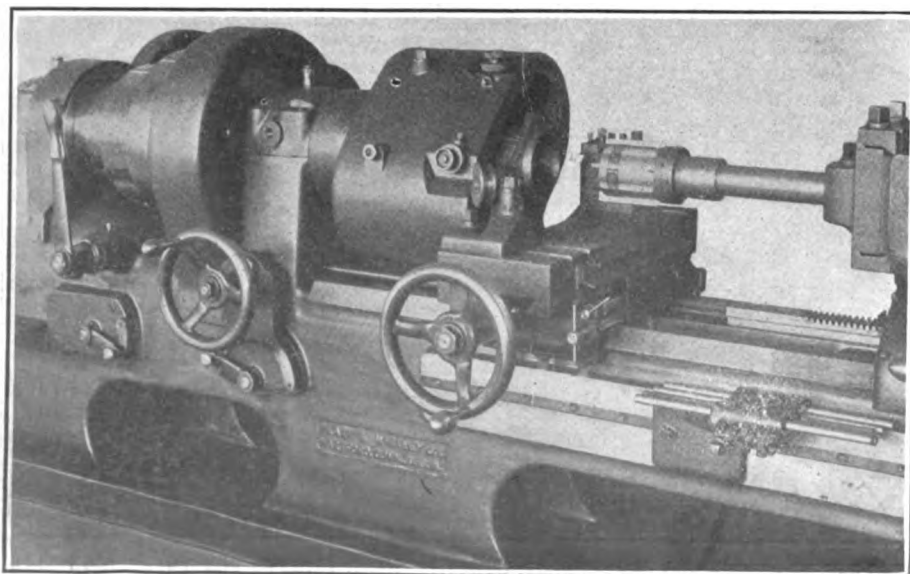
The 3 by 36 inch turret lathe herewith illustrated has been found a very efficient machine for finishing the interior and ends of small gasoline engine cylinders. It is a Pratt & Whitney lathe, made without the usual rod feeding device, but fitted with a special chuck for rigidly holding a cylinder and with turret and cross slide tools for boring the inside of the cylinder and turning and facing a collar at one end.

The work is gripped by means of two swinging clamps each operating against two fixed points. Both clamps have two bearing pins in the swinging member and consequently the work is perfectly supported at eight separate points while being machined. This complete support obviates the necessity of tight clamping, which usually distorts the casting to the extent that the bore is out of truth when the work is removed from the chuck, cylinders bored out on this lathe being perfectly true when finished.

The turret tools consist of rigid boring bars with high speed cutting tools. On the shank of one of the bars is a turning arm holding the cutter for turning the collar on the bottom of the cylinder, as clearly shown.

The reamer for finishing the interior of the cylinder is allowed to float on its shank and is of the expanding type. The cross slide and turret tools are both provided with independent power feed, each being in action simultaneously so as to economize time. The cylinder shown in the chuck has a bore of 4 inches and a depth of 7 inches. For the manufacturer who has not sufficient work to keep the machine employed solely on castings, a mechanism for rod feed through a collet may be applied so that regular rod work may be handled.

The Pratt & Whitney machine tools are sold in New York by the Niles-Bement-Pond Co., whose offices are at 111 Broadway.



PRATT & WHITNEY TURRET LATHE SHOWING MOTOR CYLINDER IN CHUCK.

Letter Box

Wood Alcohol and Glycerine Anti-Freeze Editor THE AUTOMOBILE:

[306].—Noticing in your last number the articles on non-freezing solutions, would say that in November last I purchased from the Autocar Company, of Ardmore, Pa., one of their 1905 four-cylinder cars, and as the cooling system holds about three gallons, I had it filled with a solution composed of one and one-half gallons of glycerine and an equal amount of water and then purchased a gallon of wood alcohol, which I added, a little at a time, as the water evaporated, until now, after running about a thousand miles, I have added the whole gallon. The motor in my car is quite a high-speed one, running up nearly to 1,500 revolutions at times, and this has been a warm winter; yet, in spite of this trying combination, the boiling has not yet been great enough to bother me.

I have laid the car up now for this month, and upon drawing off the contents of the radiator and filtering same, found that I had nearly three gallons left, and am confident this mixture will stand any degree of cold we get in this part of the country.

I did not try to close up the circulating system, as I did not regard the loss by boiling great enough to worry about.

My point is that this solution is at present composed of about two parts glycerine, one wood alcohol, and one water, yet in a high-speed motor the loss is not appreciable and it would need nearly Arctic weather to cause a freeze-up.

RICHARD A. STREIT.

New York City.

Double Bevel Gear Drive Transmission Not New.

Editor THE AUTOMOBILE:

[307].—We note that you describe the improved form of transmission used by the Mercedes, Knox, and Bliss companies in the January 25 issue. We take it from your article that you assume this gear to be a new type of gear which has only recently been used on American or foreign machines. We beg to state in connection with this transmission, this type of transmission has been used on the Chadwick cars for the last three years.

We are inclosing herewith copy of letters patent, February 21, 1905, which you will note is somewhat in advance of the first description of this type of transmission used on the Mercedes car. The gear was used for nearly a year before the patent was applied for, and the patent paper shows the application to have been filed August 4, 1903. The description of the gear and drawings shown on this copy are practically the same as those used on the present Chadwick cars, with the exception of the ball thrust bearings, which have been added to the new transmissions.

We also beg to call your attention to the fact that the Chadwick transmission is far simpler in its arrangement of clutch gears than the gears which you have described. You will note from examination that the case is very compact and allows for four forward speeds and one reverse, with direct drive on the high. By referring to your issue of November 2, you will find that you have already described this transmission as having been used on the Chadwick cars.

FAIRMOUNT ENGINEERING WORKS.
Philadelphia, Pa.

Following are the four claims on the Chadwick transmission as contained in the Letters Patent, No. 782,898, of which one sheet of drawings is reproduced herewith:

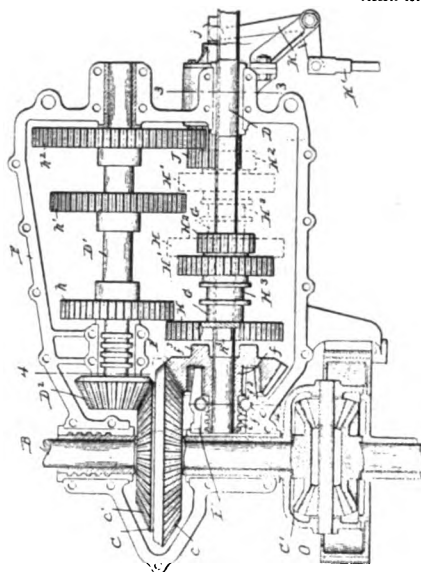
1. The combination with the driving-shaft of an automobile and a gear thereon,

No. 782,898.

PATENTED FEB. 21, 1905.

L. S. CHADWICK.
AUTOMOBILE GEAR.
APPLICATION FILED AUG. 4, 1903.

4 SHEETS—SHEET 4



PATENT DRAWING OF CHADWICK TRANSMISSION.

of a hollow bearing, a gear surrounding said bearing and meshing with the driving-shaft gear, said gear having a hollow hub entering the opening in said bearing and an operating-shaft having a seat on bearing in said hub.

2. The combination with the driving-shaft of an automobile and a gear thereon, of a hollow bearing, a gear surrounding said bearing and meshing with the driving-shaft gear, said gear having a hollow hub entering the opening in said bearing and an operating-shaft having a seat or bearing in said hub, and a clutch adapted to make engagement between the operating-shaft and the gear meshing with the driving-shaft gear.

3. In an automobile, in combination, an idler-gear, a bearing in which said idler-gear slidably fits, a shaft to which said gear is secured, a guiding collar, making a slid-

able fit with said bearing, upon said shaft, an operating-lever and connection between said operating-lever and shaft.

4. In an automobile, in combination, a gear-case, an idler-gear, there being an orifice in said casing in which said gear slidably fits, a shaft to which said gear is secured, a sliding collar, making a slidable fit with said orifice in said casing, upon said shaft, an operating-lever and connection between said operating-lever and shaft.

Some Points to Disturb Complacency.

Editor THE AUTOMOBILE:

[308].—In your January 11 number are several letters on the automobile situation from some well-satisfied gentlemen in response to your request. They are to be congratulated as to their financial outlook, but their letters read like past forty.

None will admit that he don't grind cylinders, rings, all joints; that he has not the best carbureter; that he does not use balls or rollers everywhere possible; his transmission and control approach perfection. By all this he saves gasoline. It costs one cent a mile for gasoline to run a 2,200-pound car. Given a car with no friction and 100 per cent. engine economy, one-half cent per mile might be saved.

The consumer may select any standard American tire or the Continental. Mr. Alam or Mr. Alamedam refuses to take a stand here. Tires for the 2,200-pound car, after all is told, cost six cents per mile. Neither of the above gentlemen is paying any attention to this item of expense. He gives you your choice, and you can't blame him. Why don't he design a car to run on solid tires? It can be done and will be done with as much comfort to the passenger as now given. He can cut down the tire expense to one-half cent per mile. Why don't Mr. Pennywise wipe off his smirk and start after that five and one-half cents?

Anyone who ever steered a car all day knows how tired his arms were at night. Why doesn't Mr. Satisfied steer by power, as is done on boats? It can be done by touching a button, and the wheel which prevents the driver from saving himself at the last ditch could be eliminated. Mrs. Burton Harrison's chauffeur absolutely dared not let go of the steering wheel. Why don't Mr. Shortsight operate the emergency brake by the foot?

Can the balls or rollers be defended by correct theory? If they are perfect, is not the stress in them infinity? If they are not perfect, are they not running in a hollow of their own making, overcoming the resistance of inertia and elasticity? Does this not mean quick destruction? Is this not a sacrifice of all mechanical good practice to a selling point?

With increased knowledge maybe a car will be built without the gears and fool-proof. But we can bear up under these.

A CRANK.

Buffalo, N. Y.

Riding Double with Difficulty.

Editor THE AUTOMOBILE:

[309].—I have before me a clipping from a recent issue of your publication and note your comment upon an article which appeared in the January issue of *The Gleaner*, which I feel has been unfairly handled by you. Had you reproduced the article as published we would have taken no exceptions thereto, but you leave the impression with your readers that we are antagonistic to the owners of automobiles, which is not a fact. We recognize the fact that they are here to stay and we want to do all we can to educate the farmer that the automobile owner has rights and that he should do his share to bring about a better feeling, and that they should get in closer touch.

Please bear in mind that we shall always advocate drastic measures to the fellow who drives his machine through the country as fast as his power and the condition of the roads will permit, totally disregarding the rights of those who are unfortunately in his path, and who never stops to help those who are in distress, strewn by the roadside, oft-times with broken bones and smashed vehicles, caused by frightened horses not yet accustomed to automobiles. For such unprincipled whelps there is nothing too mean to do, and we are willing to stand on this platform.

You accuse us of making "grand-stand plays" to the farmer, and you, no doubt, are making the same kind of a move to the automobile owners, but we cannot see how you can help or better the conditions by commenting only on a few lines of the article in question, omitting the part which would have placed the matter in a light where any honest and fair-minded automobile owner would have indorsed every word we said. We are now compelled to follow up the matter and convince our readers and others that we are in the right.

I respectfully call your attention to the article inclosed, from our January issue, covering nearly a page, advising our readers how to get their horses acquainted with automobiles. I think we are fair.

Detroit.

JAMES SLOCUM.

With no intention of being unfair in criticism, we do not see how the general trend of the article, which was too long to be quoted in full, can mitigate the specific recommendation made by the editor of *The Gleaner* for farmers to "trot out with a board filled with nails, lay it in the track, points up, and the 'dare-devil' will soon come to grief."

While this suggestion is made for adoption as a retaliatory measure against "the fellow who comes along with a machine, driving everyone to the fence corner, causing runaways, passing on with a grin," the act would be one of lawlessness, and it ought to be beneath the dignity of any reputable paper to suggest the correction of one evil by committing an equally illegal

There is the less excuse for the recommendation, since in the same editorial *The Gleaner* points out the proper and legal means for putting an end to the scorching evil, which all decent automobilists condemn. "All you have to do," it says, "is to take the number, which must hang in the rear of every machine, write to Lansing for the name of the owner, and make complaint before your local justice, and the sheriff will get the violator, no matter in what part of the state he may reside. He will stand a mighty poor chance of escaping conviction in your local justice court, and you certainly have the best of him." Even in this there is implied the well-known bias of country justices and jurymen against automobile users.

In view of the remarks made by the publisher of *The Gleaner*, both in his paper and in his letter, it is amusing to read the letter from one of his acquaintances printed in these same columns this week. It looks as if Mr. Slocum were having difficulty in riding with one foot on the horse and the other on the automobile.—Ed.

Legislation Needed for Map Changes.

Editor THE AUTOMOBILE:

[310].—Herewith please find copy of a letter containing the latest information regarding the Geological Survey maps. It seems that legislation is required. Anything that will assist the Director in securing this would, I should think, be greatly appreciated by automobilists.

A. Post.

New York City.

HON. WILLIAM P. BROWNLOW:

In reply to your letter of January 3, inclosing letter from Mr. Augustus Post.

The matter referred to—the distinction of classes of roads, that is, between macadamized or paved and dirt roads—has been under consideration. It is found that owing to the difficulty of making alterations in the symbol adopted representing roads on our atlas sheets, there being fifteen hundred of these atlas sheets already engraved, it would not be expedient or practical to show by an engraved symbol the distinction between macadamized roads and others. For the propose of a road map, especially designed for automobile traveling, the most satisfactory method would be by overprinting in some distinctive color, say red, such roads as may be used by automobiles. This could be done on all sheets for which special request is made. Doubtless in the eastern states this would affect every one of the eastern sheets, whilst in other sections of the country many sheets could thus be treated.

This office, however, is not authorized to expend its appropriation for the engraving and printing of maps for this purpose, and methods would have to be found to enable it to do so. There is now pending before Congress legislation which, if favorably acted upon, will enable the Geological

Survey to adapt its maps to this purpose and to other purposes. The legislation contemplated authorizes this office to print maps of this kind at the request of private individuals or institutions, the money received from same to be turned into the Treasury, and to be credited to the appropriation from which it is expended. If this authority is granted, the Survey will then be authorized, on request received from individuals, associations, etc., to supply their needs.

I note what Mr. Augustus Post, Chairman of the Touring Committee of the American Automobile Association, says with respect to meeting the expense of this work by his association, but under the law this cannot be done. Should the legislation recommended become a law, the usefulness of the maps of the Survey would be greatly enhanced and would meet the requirements of the Automobile Association.

CHAS. WALCOTT,

Director U. S. Geological Survey.

Change of Attitude Impending.

Editor THE AUTOMOBILE:

[311].—I noticed an article in *THE AUTOMOBILE* a few weeks ago on the scattering of nails in the highway, in which you refer to the upholding of such acts by the publisher of *The Gleaner*, printed in Detroit, Mich.

I happen to be well acquainted with the publisher of this paper and think we have nothing to fear; in fact, I believe it will not be long before the articles in *The Gleaner* will be of a reverse nature, as the publisher has always been very desirous of owning an automobile, and has only refrained from a purchase because of his fear of "the gallery" to which he plays, but has finally got the fever to such an extent that I do not believe it will be possible for him to stay out of "the game" more than a few months longer at the most. V. M.

Detroit.

Horizontal Engine with Vertical Valves?

Editor THE AUTOMOBILE:

[312].—Can you advise me who makes an automobile with double-opposed engine in front, of about 20 horsepower, with vertical valves, shaft drive and detachable tonneau? The chief consideration is the valves. I can find cars enough with horizontal action, but this is wrong design, as they wear on the side. R. L. S.

Deep River, Conn.

Wants Motor Cars for Railroad.

Editor THE AUTOMOBILE:

[313].—A friend has asked me to make inquiry about gasoline motor cars for use on a five-mile suburban passenger and freight road to be built. Therefore, if convenient, will you kindly request any of your advertisers manufacturing these cars to communicate with me.

Pittsburg, Pa.

Ed. J. EVANS.

Patents

Buckboard Automobile.

No. 810,636.—L. B. Gaylor, of Waltham, Mass.

The friction drive of the Orient buckboard. The motor, instead of being mounted on the axle, is supported on the rear end of the main frame, with its shaft fore and aft. A friction disk on the front end of the shaft drives a wheel slidable on a sleeve on the cross differential shaft, which drives the rear wheels by sprocket chains. The friction disk itself is movable on the crankshaft to engage or disengage with the friction wheel.

Carbureter.

No. 807,144.—B. F. Walker, of Bridgeport, Conn.

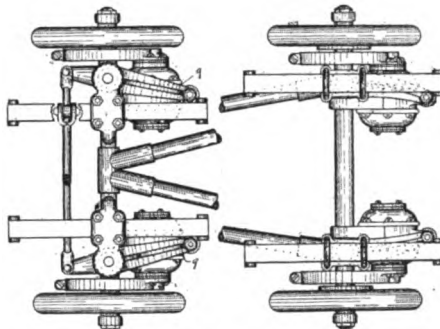
This is a carbureter having a mixing chamber above the spray nozzle, partly closed by a shutter which acts as a throttle valve, and moves vertically up and down. Passing centrally through this shutter is a needle valve which partly closes the orifice of the spray nozzle, and the two are operated simultaneously by a pair of connected cams in such a manner that both are closed proportionately. An inverted conical compression spring, whose apex surrounds the spray nozzle, and which at its large end bears upward against the throttle shutter, contributes somewhat toward the mingling of the air and gasoline. As the shutter is pressed downward to close it, the upper coils of the spring, being weaker, close together first and restrict the passage of air to the lower coils, which are closer to the spray nozzle.

Multiple-Disk Clutch.

No. 810,783.—J. D. Maxwell, of Detroit, Mich.

The particular clutch construction shown. The driving shaft *A* carries a spider *C*, whose arms *C'* loosely engage notches in disks *H H*. The complementary driven disks *F F* move loosely on a feather *F'*, set in a hub *D'* keyed on the driven shaft *B*, and integral with a disk *D*. A three-armed

carrier *J* is screwed on *D'*, and the dogs *K* which it carries are forced by the spreader *L* into engagement with disk *G*, thus locking all the disks together. Springs *I I*, riveted to disks *H H*, separate the latter when *L* is withdrawn. As is evident, no end thrust is imposed on *A*, whether the clutch is engaged or free. A special point is



PFOUTS FOUR-WHEEL DRIVE.

made of buttons *H'* of "abrasive" material set in holes in disk *H*, for the purpose of increasing the efficiency of the clutch.

Spark Timer.

No. 804,783.—R. Varley, of Englewood, N. J.

A spark timer arranged so as to maintain a substantially constant time of contact regardless of changes in the engine speed. It has a set of contact makers, one for each cylinder (separate coils being used), and a separate cam, with as many lobes as there are cylinders for breaking the circuit. The contact breaker is wired in series with the four contact makers, and these with the several coils. The plates which carry the makers and breaker are so connected that when they are rotated to advance or retard the spark time, the maker plate moves further, thus allowing a longer dwell on the advance.

Muffler.

No. 807,322.—H. R. Selden, of Rochester, N. Y.

This is a muffler comprising a central cylindrical chamber and two annular chambers surrounding it. The gas enters the central chamber and moves a piston normally held by a spring about midway in the

chamber, so that the spring is compressed to give the gas the entire length of this chamber for preliminary expansion. As the pressure falls between exhausts the piston returns to its first position.

Running Gear.

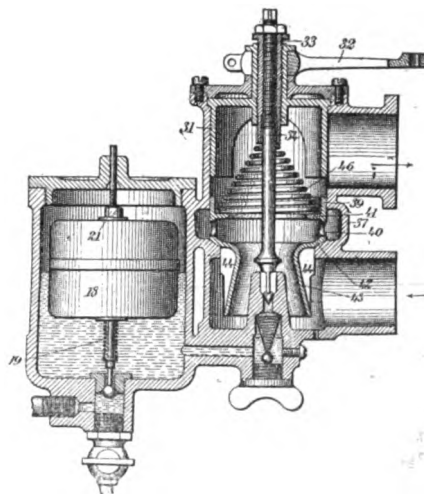
No. 810,881.—L. S. Pfouts, of Canton, O.

An electric four-wheel drive in which the steering knuckles are formed with extensions 9 to carry independent motors driving the front wheels by single-reduction gearing.

Carbureter.

No. 810,792.—J. McIntosh, of Lansing, Mich.

An automatic carbureter of the construction shown. The height of the float 18 is adjustable on the stem by means of the nut 21, which acts as a stop against the pressure of the spring 19. The main air stream passes upward inside the cone 43 and out between the coils of the spring 46, which bears against an extension 41 42 of the cone.



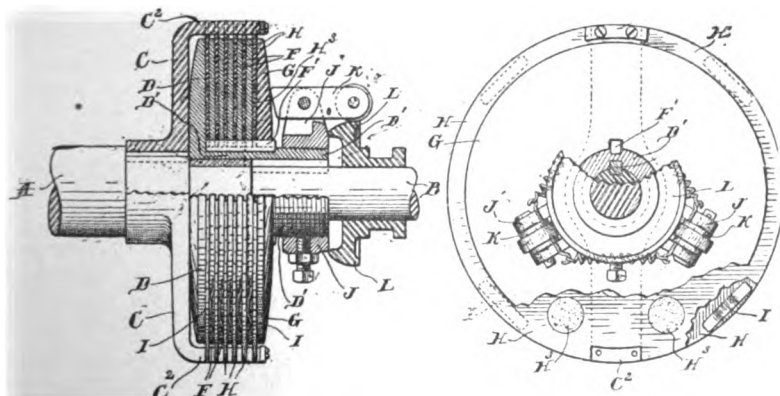
MCINTOSH AUTOMATIC CARBURETER.

This cone is removable vertically, and is guided by vanes 44. When the suction is sufficient, the cone lifts, and a part of the air stream passes up by the vanes to the annular space in 37, and through holes 40 to join the carbureter stream, thus diluting the latter and also reducing the suction. The spray nozzle is adjustable by screwing the stem 34 up or down, and the tension of the spring by screwing the bushing 33. The mixture is throttled by turning the shutter 31 by the lever 32.

Motor Suspension.

No. 810,674.—F. B. Rae, of Detroit, Mich.

A frame for suspending an electric motor which drives the rear live axle by single reduction pinion and gear. One end of the frame is pivoted on the axle sleeve and the other is spring-supported. This eliminates part of the friction which would be entailed by pivoting the frame directly on the live portion of the axle, as is done in street cars.



MAXWELL MULTIPLE-DISK CLUTCH.



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No. 6.

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The Western Show. Considering that the Chicago show is scarcely more than the transplanting of the show from New York a thousand miles westward, the exhibition loses none of its interest thereby. Rather its significance is increased. An eastern show at New York, inviting the eastern patron to an inspection of an eastern car designed for an eastern road map, at once would be an altogether different proposition to the removal of the eastern show bodily to the central market of the central west.

Chicago began more or less with the idea of a western show. It preserved the idea for a few years, but this season it may be said that the one-show idea is accepted—the eastern exhibitor going to the west and the western manufacturer reconciled to going to the east—all in recognition of the fact that because of mere geographical extent the country is demanding two show places for the present, with a question mark as to the possibility of a future far western center for exploitation. It may be said by some unthoughted ones that two great shows within a thousand miles smacks of repetition and extravagance; the answer may be found in the tremendous geographical stretch of the continent. If geography demands that the eastern and foreign exhibitors shall come west for an annual show, it also holds out to them the western

market that is tributary to their business. If Chicago shall continue to be the market center for the west, Chicago must continue the show place; Mahomet must go to the mountain.

Going to the west, both the eastern and foreign builders are finding the incentive in the activities of the Chicago show. More foreign cars are represented there this year than ever before, and in spite of the fact that the eastern and the western car at home have been raised immensely in standards. It might be questioned if this representation of the foreign cars has been developed out of the demand already made for it, or whether because of a limited market in the east the foreigner is reaching out in the hope of a field. So far the foreign car in the Chicago market is not significant, but it may be marked on all sides that there is an increased interest in them. The Chicago Market is beyond that period when it was content to look on at the glint and shine of a hooded chassis and upholstered tonneau and forego looking underneath.

Foreign, eastern or western, the representative in the booth is demonstrating and he is expecting to be asked to demonstrate. It is nothing that the western fancy is caught by color combinations out of the ordinary. It is accepted that the open car over the covered vehicle shall be conceded to a popular taste. Technical and mechanical excellences are in the balance and in these the market is asking to be shown as essential points. The runabout types may hold crowded attentions of those who would drive cars if they could, but in the same breath the attentions are held of those who can drive the best if they would.

Geographically, a repetition of the New York show has become necessary. Commercially, it has become well worth while, even if the Chicago show management shall find it necessary, as this year, to expend \$30,000 in preparation for the second event.

**Radiator and Hood Design.**

Unity of opinion among manufacturers of automobiles in the matter of exterior design is a reflection of the tendency toward finality of mechanical construction, which, while not yet reached, has at least set in. The day has passed when a car of any make can be identified as it flashes past on the street or country road, although many representative automobiles are characterized by some detail of radiator or hood design, giving them an individuality that makes their identification an easy matter.

The popular type of hood with the front closed with vertical radiator is the logical outcome of a desire to afford the most direct possible means of heat radiation to the cooling water, and was first used with the earlier Panhard models, at that time fitted

with the round gilled-tube radiator. The Mercedes type set the fashion for cellular radiators, and of necessity was placed well up in front, closing the bonnet front and giving an excuse for the design now generally used in one form or other by far the greater majority of makers.

In spite of its popularity, this form of arrangement has some drawbacks, the most manifest advantage being the direct piping for the water and the favorable location of a fan to assist cooling, then again the placing of the radiator well up from the ground contributes not a little to avoidance of dust and dirt and accidental injury. The most serious drawback is the way in which the motor is fenced in, the wheels and mudguards on either side with the dash at the back and the radiator in front providing a compartment not always as accessible as it might be. In a number of instances the manufacturer has recognized the prime requisite of accessibility and by providing a considerable space between the motor and the radiator and a corresponding space at the back between motor and dash has earned the thanks of many an owner and driver.

In the matter of radiator design the cellular type has by no means been slavishly copied, though the general outlines have been so widely adopted that it may be accepted as no longer a detail for car identification. There are a few exceptions to the use of the straight or square hood with vertical radiator, such as found in the C. G. V. and Renault cars in France and in the Auto-car runabout here. England also contributes a few examples, but the American builders, even of air-cooled cars, have so universally adopted this design that it will keep the car bearing it up to date in appearance doubtless for years to come.

**A Few Words for Dobbin.**

In the enthusiasm over broken records and the surpassing of the speed of the steam railway, it is well to remember that the possibilities of the automobile, while far beyond the expectations of a few years ago, are not fairly to be compared with other means of transportation. Each method of transportation—for speed contests are but the sporting element of the more serious problem of transporting man, mails or freight between given points—should be compared one with another relatively only. By far the most remarkable records, when so considered, still repose with the horse.

That this should be stated in a journal whose sole object is *equinectomy* may seem strange, but the spirit of fairness calls for a more careful consideration of speed records than heretofore given in the automobile press. The recent records made on the wave-ironed beach at Ormond should not be compared with the performances in the Van-

Rallying Against Drastic Jersey Bill.

derbilt cup race or in the Glidden tour, yet such comparison is more reasonable than their comparison with the fastest times of steam locomotives, electric cars, bicycles or horses.

In a class by themselves—but for all that perhaps no less remarkable, and probably the most phenomenal records ever made in the way of covering ground between widely separated points and under adverse conditions—there is nothing in the history of the automobile comparable to the results attained in pioneer transportation in the Great West in the early days before the completion of the transcontinental railways.

That to-day almost insurmountable difficulties confront the transcontinental automobilist is an evidence of the seriousness of the problem when there existed little more than trails of the rudest sorts, yet the Pony Express, organized for regular mail service, was in active and continuous operation for more than two years with the record of but one failure in all that time. The total distance covered was 1,950 miles between the termini at Independence, Mo., and San Francisco, uniformly accomplished in ten days with relays of riders from sixty-five to 100 miles apart.

The equipment comprised more than 500 of the fastest western horses, about 200 station men and eighty riders. The daily average performances of the men and horses were in themselves remarkable, but the exceptional records such as a continuous ride of 384 miles in one case and of 340 miles inside of thirty-one hours in another are unrivaled in the history of transportation under adverse conditions. The star performance of this unique American enterprise was a relay trip over the full route of 1,950 miles in seven days and seventeen hours.

Given roads of fair surface and negotiable grades, the automobile can easily surpass these phenomenal records of the romantic Pony Express, and without the advantage of relays, but the only fair basis of comparison is not between the two widely different methods of transportation, but rather between the various performances of each. Railroad records are made under favorable conditions and are interesting when relatively compared; so, too, are the records made by the automobile; but the greatest value in such results as have been attained within the past few years is the increased fund of knowledge afforded the constructor rather than the new array of figures for the statistician.

ENDURANCE AND ECONOMY TESTS.

Two events decided upon by the Board of Governors of the Automobile Club of America for the coming spring and fall are an endurance and economy contest, for which two handsome prizes will be offered. A committee of seven members is to be appointed by the governors to formulate rules and conditions for the tests.

TRENTON, N. J., Feb. 5.—One of the first signs of activity shown by the new Associated Automobile Clubs of New Jersey is the issuance last week of circular letters to automobilists throughout the state calling attention to the objectionable features of the Frelinghuysen automobile bill recently introduced in the New Jersey legislature. The fifteen principal provisions of the measure are chiefly summarized in a sheet urging all automobilists to use their influence through their representatives and senators, through garage and road-house proprietors and through their immediate friends to secure the defeat of the bill.

"We are anxious to have it understood," says Secretary J. E. Gill, "that as an association, we are in favor of legislation that is necessary to regulate automobiling; in fact, we have never refused to co-operate with the authorities for the punishment of offenders.

"The automobile law that New Jersey now has is generally considered one of the best and most reasonable in the country. We do not object to amendments to the existing law, if circumstances really demand it, but we are bitterly opposed to anything so drastic and unreasonable as the Frelinghuysen bill.

"First of all, we object to the Frelinghuysen bill because it proposes to establish an Automobile Department with a high-salaried chief, whose department will receive from \$10,000 to \$12,000 annually of the taxpayers' money. This money had better be spent on improvement of the roads of the state, especially when the present office of the Secretary of State has proven its ability to look after automobile affairs in a very satisfactory manner.

"We also object to the authority which the bill would invest in the automobile commissioner. He would have the right to dictate as to the kind of tire protectors, skidding preventers and similar devices to be used on machines, and this would open a channel for 'graft' and annoyance of all kinds.

"Then, again, we object because the commissioner would be the only person with power to renew a license that had been revoked by a magistrate, the bill giving to every magistrate power to revoke, but not to renew. Under such provision it would often be necessary for an automobilist from a distant part of the state to come to Trenton, to the automobile department, for a renewal of license, at much expense and inconvenience.

"We are not opposed to the paying of an annual registration fee based on the horsepower or the weight of the machines, but we think the Frelinghuysen rate of fifty cents per year per horsepower, together with an additional twenty-five cents per year per horsepower for the driver, is too much. It would compel automobilists to pay the

state about \$160,000 per annum, and this would be more than 50 per cent. of the entire road repair appropriation as now scheduled. To make six or eight thousand men pay half of the road outlay of the state does not seem to be just or reasonable.

"Then look at the absurdity of the provision making short-time tourists pay \$1 per day license. The record breaker who crosses the state in a few hours without spending a cent would have to pay the minimum fee of \$2. The man who tours about to the different resorts and spends several hundred dollars for a week's outing would have to pay several times as much. Summer commuters from seaside and country resorts would be put to a big expense or would be compelled to take out an annual license for their few months' stay. It would be better to have a registration fee reasonable enough to obviate the necessity for the short-time tourist class. Let all be treated alike, for automobilists of New Jersey are opposed to hold-up methods.

"The provision authorizing arrest without a warrant would subject thousands of respectable and innocent automobilists to the annoyance and expense of paying tribute to whatever county constable might choose to take them in custody. Then, again, the section which makes the fine limit \$500 is a bad one. It would make it possible for any magistrate to impose that amount for merely trivial offenses. The present law is much better, as it graduates the fines according to the seriousness of the offense."

The Associated Automobile Clubs of New Jersey includes among its members some of the best known men of the state, a number of them being lawyers, while others are professional men of high standing, and several are members of the present Legislature. The result of the club's fight against the Frelinghuysen bill will be the introduction in the Legislature of a number of amendments to the present law, seeking to correct possible defects. These amendments will, it is expected, pave the way for the defeat of the Frelinghuysen measure. The amendments will be made satisfactory to automobilists and to the general public. They will probably be drawn by a committee of three automobilists and three farmers, as was done last winter when the present bill was framed.

The organization is affiliated with the American Automobile Association, and whatever assistance that organization can give will be forthcoming. There are 14,000 automobiles registered in New Jersey and 6,000 are owned by people living in the state. Of the resident automobilists fully 1,400 are members of the association.

OPPOSE JERSEY AUTO BILLS.

PHILADELPHIA, Feb. 5.—Local automobilism is as much wrought up over the Frelinghuysen bill, which is now before the

New Jersey Legislature, as are the auto owners of the state across the Delaware. In the event of its passage they will be as much affected by its radical provisions as will the Jerseymen; indeed, more so, for some paragraphs of the measure seem to be aimed at them particularly.

The \$2 fee required of non-resident motorists on entering the state, with an additional charge of \$1 daily thereafter during their stay, would be a serious matter to the great majority of Philadelphia car owners, who have been in the custom of "doing" Jersey on Saturday afternoons and Sundays whenever the weather is suitable. Then there is the clause against the use of chain grips and steel-armored tires on macadam roads; the provision giving simple justices of the peace the right to revoke a license and the heavy penalties.

The local dealers' organization and the Automobile Club of Philadelphia are preparing to invade Trenton not only tomorrow, when the committee will listen to objectors, but later on when the bill comes up for final passage—if it is not killed in committee. Backed by a strong array of legal talent, many members of both organizations will go to the Jersey capital tomorrow in an effort to scotch the snake.

The Jackson bill, introduced last week, while quite moderate in comparison with the Frelinghuysen measure, would bar from the Jersey roads all cars capable of traveling faster than twenty miles an hour.

AUTO TAX BILL IN ABEYANCE

ALBANY, Feb. 5.—Senator L'Hommiedieu has not pushed his bill to tax autos, and it remains in the Senate committee on taxation and retrenchment. Chairman Lewis of that committee says he has received several communications from automobile men asking for a hearing, but fixing no date, and so none has been set. Senator L'Hommiedieu has not asked for a hearing yet, as he has an appointment to meet A. R. Shattuck in New York, and says he expects to meet other automobile owners and members of clubs and to see if some agreement on an automobile tax measure cannot be secured.

ROAD OILING BILL PASSES.

COLUMBUS, O., Feb. 5.—Owners of automobiles are much gratified over the passage, by the House of Representatives, on Friday last, of the Paxton Bill providing for the sprinkling of oil on macadam streets in cities and villages. It is claimed that in the long run this will be far cheaper than the use of water and will be a good substitute for asphalt. The author, who is an enthusiastic automobilist, declared sprinkling with crude oil would go far to remove the dust nuisance, which is also a spreader of disease germs. One sprinkling of oil would answer for a year, and would cost fourteen cents per lineal foot to abutting property owners, while the perambulating water cart costs much more, he said. The oil forms a

crust which sheds water and resembles asphalt.

As it passed the House, the bill provides that streets may be sprinkled with oil, on petition of a majority of the residents of a street, at their expense, or five-year contracts for the use of oil may be authorized by the Board of Public Service in cities and the Common Council in villages, in which case only half of the cost is to be borne by the property owners.

NEW BILL IN OHIO.

COLUMBUS, O., Feb. 5.—A bill is being prepared for introduction in the Legislature, providing for a law governing the licensing of automobiles. It is proposed that the name of the city, as well as the number of the machine, be attached to each automobile.

Automobilists have organized a lobby to fight a measure pending in the House which restricts speeds on country roads and provides for certain actions when fractious horses are encountered and how much of the road autoists may have.

HORSE TRUCK RUNS DOWN AUTO.

New York city's new police commissioner, General Bingham, was involved in an automobile accident on the 5th instant that not only ruffled the temper of the commissioner, but resulted in damage to his big touring car. He was being driven eastward through Chambers street at a time when that thoroughfare was congested with traffic of all kinds when a heavy horse-drawn truck in charge of August McKibben crashed into the side of the car, staving in a couple of panels and otherwise damaging the machine. The chauffeur, a patrolman, tried to avoid the truck, but the driver swung into Chambers street at a rapid pace. The commissioner caused the arrest of the truck driver on the charge of reckless driving.

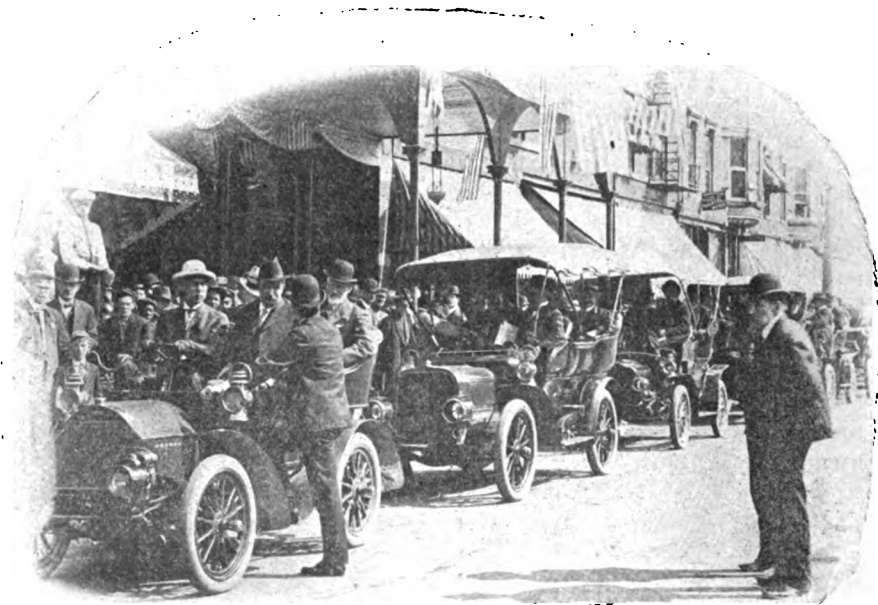
A Legislators' Outing.

A novel and most successful use of automobiles is illustrated in the accompanying engraving, which shows a party of legislators of the lower house of the Michigan legislature ready to start from Benton Harbor to make an inspection of the neighboring peach orchards last fall.

In the first car are Governor Fred M. Warner, Speaker S. F. Master, and Representative McKay. In line behind this are nineteen other cars occupied by some of the most prominent politicians, law-makers and business men of the state.

The occasion was meant as an object lesson to impress upon the legislature the importance of the Benton Harbor district as a fruit-growing section, and the trip was made in the height of the peach shipping season, during which 2,000,000 bushels of this fruit were gathered and shipped. The idea was conceived and put into effect by Sam H. Kelly, who represents one of the Berrien County districts in the state legislature. The automobiles were loaned by owners of cars living in Benton Harbor and St. Joseph.

Not only is great direct good sure to result from the trip, but it created a better feeling on the part of farmers and fruit-growers toward the automobile, that hundreds of soil tillers and country folk in all parts of the country previously considered a real "devil wagon." The progressive and successful fruit-growers liked the idea of loading up one branch of a state legislature and rolling it right onto their farms. Some of the farmers gave the visitors a tempting dinner under the fruit trees and made their call an enjoyable one. It was a function that did good all around, and one that may well be imitated by other sections of the Middle West.



THE GOVERNOR AND MEMBERS OF THE HOUSE OF REPRESENTATIVES OF THE MICHIGAN LEGISLATURE STARTING IN TWENTY AUTOMOBILES ON AN INSPECTION TOUR OF BERRIEN COUNTY PEACH ORCHARDS.

Fine Prospects for the Season in Omaha.

OMAHA, Feb. 3.—The year 1906 opens most auspiciously for the local automobile trade. Omaha and the country tributary to it are in a generally prosperous condition and dealers are sanguine that the sales in 1906 will be several times what they have been in any previous year. The Omaha garages contain a fine assortment of new models and the buyer will have here one of the best lots to choose from ever assembled between Chicago and San Francisco. The new models came out in advance of the big Eastern shows.

GARAGE DEVELOPMENT CONTINUES.

Garages and salesrooms have multiplied in Omaha until Farnam street from Twenty-first to Eighteenth street is known as "automobile row." The city now has five exclusive garages, three special buildings having been constructed for the purpose last year. One of these, that of the Powell-Bacon Company, became too small in a single season and will have its floor capacity doubled this spring.

Dealers expect to see the number of cars in the city doubled before the middle of summer. High-powered machines with light frames are not popular here, because of the hills in the city and the rolling country in the vicinity, which are severe on anything but the heavier and slower machines. These stand the wear and tear of the grades and poor roads better, and in general they are more satisfactory, because of their reliability.

AUTOMOBILISTS SECURE ROAD IMPROVEMENT.

Automobilists have done a great deal toward improving the roads near Omaha and in different parts of the state. As is usual in other communities, men of influence own many of the cars, and when they demand road repairs the result is generally observable. The Omaha Automobile Club appeared before the Park Board and secured repairs on Sixteenth street and had Dodge street paved with macadam from Fortieth street to a junction with a good county road leading into the country.

The club, which was organized last year, is preparing for an active season. One of the chief aims of the organization will be to curtail reckless driving. Not long ago a boy was run into and severely hurt on Farnam street, and the car escaped in the darkness, the accident occurring late in the evening. The club immediately offered a cash reward of \$25 for information leading to the arrest of the driver, but his identity was not discovered.

Some talk has been heard of building a clubhouse, but this may not materialize this year, and the club will probably secure quarters with some other organization.

GOOD PROSPECTS FOR THE SEASON.

The Deright Automobile Company, the newest organization of the kind in the city, has just moved into the two-story building

constructed for it at 1814-1816 Farnam street and now occupies the largest place in Omaha devoted to the business. On account of being conveniently located near the shopping district and with accommodations for showing a large line of cars in a handsome showroom, the company is certain to prove a strong factor in the local automobile market. Regarding prospects for the present season Mr. Bromwell, of the Deright company, says: "There has never been a year that will approach 1906 in the number of automobile sales, and Omaha will not run behind the rest of the country. Since January 1 we have received more than 100 applications for catalogues from out of the city from people who have not a ready opportunity to inspect our new models. We have booked a number of orders for later delivery, and indications point to our being sold out on our larger models by March 1. Our line includes the Stoddard-Dayton, Reo, Ford and Waverley electric."

R. R. Kimball, of the Kimball Automobile Company, whose new garage is nearly perfect, from an artistic standpoint, attended the recent races and speed trials at Ormond, Fla. His manager reports an excellent outlook for the coming year's business.

H. E. Frederickson, when in New York recently, added the Buick and Haynes cars to his line of Cadillacs and Peerless machines already carried.

DOING BIG BUSINESS WITH RAMBLERS.

The Rambler Automobile Company has just received a carload of 1906 models and they have been eagerly inspected by local automobilists. The Rambler people say they placed two cars of their make to one of any other in Omaha last year and expect to do even better in 1906.

J. M. Larson, one of the leading automobilists of the city, had a \$6,000 Peerless car destroyed a few weeks ago by a fire and explosion in his garage. A match thrown on the floor ignited gasoline and grease, and in a few seconds the blaze was beyond control. Explosions followed and the automobile was totally ruined. It is likely that Mr. Larson will buy another car soon.

The "seeing Omaha" service originated by the Powell-Bacon Company last year proved so popular that it will be put in operation again in the spring, with the main station at the Paxton Hotel. It will be arranged especially to give tourists stopping here an hour or two on transcontinental tours an opportunity to see the city and its environs.

EFFECT OF THE OPEN WINTER.

INDIANAPOLIS, Feb. 5.—This city has had the most remarkable winter it has experienced in thirty years. Not once up to the end of January had the temperature fallen to zero, and snow has covered the ground but twice. As a result several storage warehouses that made preparations for an enormous

business are greatly disappointed, for, instead of storing their cars, Indianapolis enthusiasts are driving them every day. One storage house prepared an entire floor at a cost of several hundred dollars and it has succeeded in securing hardly more than half a dozen cars for storage.

Garage men, dealers and manufacturers are jubilant, for increased sales and continuous repair work have more than compensated them for loss in dead storage charges.

Sales during the winter have almost equaled the sales of the summer months, and in addition orders for new cars are booked far ahead of possible delivery. Most of the local dealers have sold their sample cars and have orders placed for from one to three carloads of new machines.

COST OF SIGHT-SEEING SERVICE.

St. Paul will probably have a sight-seeing automobile line next summer. The Commercial Club has formulated a plan which it is thought will bring about the establishment of such a service, which the city has felt the need of for years. A special committee appointed to investigate has returned a favorable report, embodying the following estimate of the cost and expense of operating one automobile car one season and the income from same, based upon having 100 pleasant days, between May 1 and November 1:

Investment—two automobiles.....	\$6,000	
Interest	360	
Four hundred days' labor....	2,000	
Repairs, stationery, etc.....	200	
Advertising	200	
Insurance, wear and tear....	1,200	
Gasoline and oil.....	400	
Liability insurance.....	300	
Salary of manager.....	600	
Rent of garage.....	150	
Total.....	\$5,410	
Four hundred trips, twenty passengers each, \$1.....		\$8,000
Profit.....	2,590	
		\$8,000 \$8,000

In this estimate no mention is made of extra trips, such as private parties, moonlight trips, and the extra business that could be done during the sessions of conventions meeting in the city.

TRADE SLOW IN MEMPHIS.

MEMPHIS, TENN., Feb. 5.—The total number of new cars sold in Memphis last season was less than one dozen—and that in a city which claims 170,000 inhabitants, where money is plentiful, prosperity undoubted, and the people enjoying sport. Man for man, and dollar for dollar, Memphis is probably the least progressive city in the South, from an automobilist's standpoint. No blame can be laid at the door of the yellow fever quarantine which had Memphis isolated for two months last summer. On the contrary, fear of yellow fever drove a few residents to

Northern resorts, where some of them acquired the "bacillus motori."

In the face of such discouragement the local dealers are hopeful, new cars are coming in and two new dealers are planning to enter the field.

Frank Blomberg & Co. have a handsome new garage, one of the largest in the South, with plenty of money and enthusiasm behind them. They are a new concern and sell Thomas, White, Buick and Baker cars.

Harry A. White, one of the veterans, with plenty of backing and enthusiasm, handles the Cadillac and Pope-Toledo.

Jerome P. Parker, with a garage of fair size, is agent for the Olds.

The MacDonald Automobile Company, which has a good garage, sold Whites last year, but is undecided which car will be handled this season.

The coming season should be better than any in the past. The weather has been ideal nearly all the fall and winter and the few car owners are enjoying the good roads and the fine weather.

A LANSING CONSOLIDATION.

Olds Gasoline Engine Works to Absorb Gas Producer Company.

LANSING, MICH., Feb. 5.—Consolidation of the Olds Gasoline Engine Works and the American Suction Gas Producer Company will result from action taken at the annual meeting of the former corporation in this city. This will be effected through the purchase of the American Suction Gas Producer Company by the Olds Gasoline Engine Works, but the combined corporations will be known as the Olds Gas Power Company. To the capital stock of \$500,000 of the engine company will be added \$112,000 for the purchase of the other company, making the capital of the Olds Gas Power Company \$612,000.

The business of the two corporations is closely identified and the largest interests have been held by the same persons. The Olds Gasoline Engine Works is a pioneer in the manufacture of engines using gasoline for a motive force, and make engines up to 1,200 horsepower. The American Suction Gas Producer Company was organized a few years ago to manufacture a producer of gas from coal for use in explosive engines.

The directors in the Olds Gasoline Engine Works, who may hold their positions under the new corporation, are James H. Seager, F. L. Smith and S. S. Olds, of Lansing; Henry Russell, H. H. Ledyard and H. C. Potter, Jr., of Detroit. The officers are: President, James H. Seager; vice-president, F. L. Smith; secretary-treasurer, Schuyler F. Seager; general manager, James B. Seager.

The report of the company showed a most active year, during which about three times as many engines as ever before were manufactured. Very satisfactory earnings on the stock were shown, and a dividend in accordance with the report was declared.

TWO-CYCLE ENGINE PATENTS.

Sintz and Cock Patents Thought to Cover Three-Port Construction.

DETROIT, Feb. 5.—Automobile manufacturers who use three-port, two-cycle engines in their cars, and the builders of power boats, will be much interested in the news that a patent fight is in sight.

James Whittemore, the Detroit patent attorney, has acquired the Sintz patents on the three-port, two-cycle engine. Joseph Day, an Englishman, owns the Cock patents covering the same features. Both claim their patents to be valid. The situation is thus stated:

Day's patent was issued to F. W. C. Cock, the English patent being dated October 15, 1892. Application for a patent in the United States was filed March 10, 1894, and patent No. 544,210 was granted to Mr. Cock on August 6, 1895.

The Sintz patent was granted to Clark Sintz, of Springfield, Ohio, November 21, 1893, the specifications for it being filed October 27, 1892. Briefly stated, Mr. Sintz's patent related to gas engines, and the object was to produce a gas engine in which high speed could be attained and maintained. A further object was to produce a means whereby an explosion could be secured for each crankshaft revolution. A further object was to produce a novel arrangement of the supply and exhaust ports in connection with the piston, whereby a substantially valveless engine could be produced.

The Cock patent covers the same ground, according to experts, and here is where the chance for fight comes in. It is stated that Mr. Day, owner of the Cock patents, is sure of the legality of his patents in the United States and is coming to this country to make good his claims.

PARTS COMPANY EXPANDING.

FLINT, MICH., Feb. 5.—The Auto Brass and Aluminum Company is preparing to make extensive improvements in its plant in order to take care of increased business for

1906. New machinery will be purchased, a new factory building is contemplated, and the entire organization will be immediately expanded. The company has contracts on hand for 1906 to furnish fittings to the Reo Motor Car Company for 1,600 cars, to the C. H. Blomstrom Motor Car Company for 1,500 cars, to the Jackson Automobile Company for 1,000 cars, to the Bartholomew Company for 500 cars, to the Cadillac Motor Car Company for 3,000 cars, and to the Northern Manufacturing Company for 750 cars. The company will also furnish accessories for the complete output of the Buick Motor Company for 1906. The total amount of the contracts secured up to the present time is about \$100,000.

FORD MFG. CO. INCORPORATED.

DETROIT, Feb. 5.—The Ford Manufacturing Company has leased the buildings formerly occupied by the Hayes Manufacturing Company on Bellevue avenue, south of Mack, for one year and will manufacture small automobile engines and automobile parts. The company will probably erect a factory and will be an important addition to the industries of the city.

The Ford Manufacturing Company was incorporated several weeks ago with a capital stock of \$100,000. The officers are: President, Henry Ford; vice-president, John F. Dodge; treasurer, James J. Couzens; secretary, C. H. Wills. The above, with John W. Anderson, form the Board of Directors. The other incorporators are H. H. Rackham, C. H. Bennett and H. E. Dodge.

NEW YORK TO KOKOMO IN WINTER.

INDIANAPOLIS, Feb. 5.—His machine covered with the mud of half a dozen states, and himself almost exhausted, J. W. Haynes, of the Haynes Automobile Company, of Kokomo, drove into Indianapolis a few days ago after a memorable trip in a 50-h.p. Haynes from the New York show.

Rain, sleet, snow and heavy winds were encountered, but the machine and driver



ONE OF THE EVIDENCES OF ACTIVITY IN THE INDUSTRY—FRANKLIN FACTORY IN SYRACUSE WHEN NIGHT SHIFT STARTS WORK.

held out against them all and made the trip with little difficulty excepting tire troubles. These were frequent and discouraging.

Mr. Haynes left New York city on Sunday noon, January 21, accompanied by J. C. Eikoff, an expert mechanic. Not having a license to travel through the state of Pennsylvania, Mr. Haynes was obliged to stop an extra day in Philadelphia, but the rest of the trip was made without long delays, often traveling far into the night.

The big machine climbed over the Cumberland Mountains, but instead of snow, as might have been expected, a sea of mud was encountered, and in coming down it was necessary to put on power, the mud being so deep. At other times during the trip the wheels had to be wound with ropes to prevent them from spinning.

The trip was made by way of Philadelphia, Reading and Harrisburg, Pa.; Hagerstown, Md.; Wheeling, W. Va.; Zanesville and Columbus, O., entering the Hoosier state at Richmond. Owing to tire troubles it was necessary at one time for the machine to run thirteen miles on a flat tire. The longest mileage for one day was 135 miles.

MOTORCYCLE MEETS PLANNED.

MILWAUKEE, Feb. 5.—George H. Gardner and Charles Hall, representing the Chicago Motor Cycle Club, were present at a meeting of the Milwaukee Motor Cycle Club last Thursday night, the object of their visit being to arrange a schedule of events for the coming season. It was decided to hold a track race meet at Chicago on Decoration Day (May 30), a race meet or reliability test at Milwaukee on July 4, and a race meet at Muskegon, Mich., on Labor Day, September 3. The Milwaukee club has in view a series of races on a 2 1/2-mile straightaway or a run of 100 miles on a ten-mile circuit. The Goodrich Cup, which is now in the possession of the Chicago club, will be contested for on Decoration Day by Milwaukee motorcyclists. The club now has twenty-five members, and B. P. Churchill is president.

OVER-LAKE AUTO TRAFFIC.

MICHIGAN CITY, IND., Feb. 5.—There is sure to be a big movement in automobiles here next spring. A great business is transacted by the steamboats in carrying machines across the Lake Michigan from Chicago. Auto tours are commenced from the docks on the Indiana and Michigan sides, thus avoiding a great stretch of sandy roads in Michigan.

The county authorities of Laporte county have spent a deal of money in improving the local road system. There is a good mileage of macadamized roadway and this is being increased all the time.

Next season Michigan City will take on considerable importance as a summer resort. The new steamer, *Theodore Roosevelt*, now being built at Toledo, will be the largest boat on the lakes, and will ply between Chicago and this city.

DEAD HORSE HILL CLIMB IN DOUBT.

WORCESTER, MASS., Feb. 5.—There is considerable doubt in the minds of many of the members of the Worcester Automobile Club as to whether or not the Leicester authorities will sanction the holding of another automobile hill climb on Dead Horse Hill. Since the event of last year, which gave the hill a national reputation, the Worcester club and the Leicester authorities have had many a clash, and the result looked for is the refusal of the authorities to sanction the contest on that part of the hill that comes within their jurisdiction.

There seems scarcely any doubt that Channing Smith, chairman of the Board of Selectmen, who was greatly incensed over the action of the club in connection with the funeral march of Glidden tourists through Leicester last summer, will swing the town against the club. Mr. Smith is a wealthy mill owner and has considerable influence.

HITCH IN CHICAGO CLUB PLANS.

CHICAGO, Feb. 5.—The members of the Chicago Automobile Club are again balked in their movement for a new clubhouse, as the deal with Mrs. Hetty Green for the property on which the present clubhouse stands has fallen through. The papers were ready to sign, and it looked as though everything would turn out as planned, when there came a hitch regarding the time of the lease. Mrs. Green refused to tie up her property for as long a period as thirty years, and the C. A. C. committee would not be satisfied with less. The building committee will make known its plans in a few days.

JERSEY CLUB BANQUET.

NEWARK, Feb. 6.—The New Jersey Automobile and Motor Club will hold its third annual banquet on Thursday evening, February 15, in the Continental Hotel, Newark. Each member of the club will be provided with one or more tickets. The affair will not be limited to club members by any means, as anyone wishing to attend will be welcome. President James R. English will preside at the table. There will be several good speakers and musical entertainers. The committee in charge of the banquet consists of Jacob Mason, Horace P. Cook, George Paddock, C. S. Calvert and C. E. Stengel. Those who intend to be present may inform the committee and designate where they prefer to sit, which will make it possible for members and friends to be together.

NEWS NOTES OF THE CLUBS.

PHILADELPHIA.—The annual election of the Philadelphia Motorcycle Club resulted in the choice of the following officers to serve during the coming year: President, Valentine Simmons; vice-president, Adolph Wicknick; captain, Harry Scheiter; first lieutenant, John Benders; second lieutenant, Joseph Lees; color-bearer, George W. Reinhold. The P. M. C. now has a membership

of nearly half a hundred, mostly "Indians," and a clubhouse of its own. A schedule of weekly runs for the coming season will shortly be announced by Captain Scheiter.

DAYTON, O.—The Dayton Automobile Club will hold a race meet July 4 at the Montgomery Fair Grounds track. There will be a large entry list and silver trophy cards will be awarded the winners.

PITTSBURGH.—A meeting will be held in this city about March 1 to perfect the organization of the Pennsylvania Motor Club Federation, to be composed of automobile clubs or associations and consulates of the American Motor League in Pennsylvania. A preliminary meeting to discuss the matter was held in New York city on January 16 during the automobile show. The Automobile Club of Pittsburg and the A. C. of Philadelphia are co-operating in the matter. The principal objects are to endeavor to secure the enactment of fair laws regulating the use of automobiles and other vehicles, to advocate the cause of good roads and to further the best interests of automobilists in general.

FATAL GARAGE ACCIDENT.

An unusual accident on February 5 resulted in the death of J. Emmett Gordon, garage superintendent for Smith & Mabley, Fifty-fifth street and Broadway, New York city. The accident occurred in the basement of the building, where Mr. Gordon had just taken a seat in a small electric runabout to drive on to an elevator preparatory to a short trip to the West Forty-seventh street police station with his friend, Frank Clark, to have him sworn in as a special officer for service about the garage.

The car stood near the elevator shaft and Mr. Gordon had his foot on the brake pedal. He was under the impression that the controller was in the position for cutting off the power, but when the foot brake was released, as the runabout stood about three feet from the edge of the elevator shaft, the car moved forward under first speed and the front wheels slowly slid over the edge of the opening, throwing the driver head first over the dash of the vehicle. The drop was only about three feet, but the unfortunate superintendent struck head foremost, fracturing his skull, and died about an hour later in the Roosevelt Hospital.

The elevator at the time was descending and was between the first floor and the cellar, but the operator stopped sharply on hearing the crash. The car was found to be only slightly damaged, with the brakes unset and the power on.

Gordon was thirty years of age and unmarried. His relatives live in Lexington, Ky., his former home. He had been in the employ of Smith & Mabley for a year and was well known in the automobile trade and to automobilists.

To see the two-mile-a-minute record beaten, shall we have to await the perfection of the airship?

News and Trade Miscellany.

The first 24-hour non-stop automobile run chronicled west of the Mississippi was made on January 26-27 in Denver by M. B. Fetscher and Charles Bilz. A regular stock model G Franklin car of 12 horsepower and carrying four passengers was used, and Fetscher drove during twenty out of the twenty-four hours. The start was made at 12:30 P. M., Friday, January 26, and during the greater part of the day the car traversed the downtown streets of the city; trips were also made into the suburbs. Observers accompanied the car throughout the test. The actual distance traversed was 325 1-2 miles, and although a number of stops were made, the engine was kept running. In the twenty-four hours 19 1-2 gallons of gasoline and 3 quarts of lubricating oil were consumed.

Charles J. Glidden, who is touring the world in an automobile, has been heard from in Muttra, India, in which country he covered a distance of 3,350 miles, bringing his total mileage up to 28,450.

The John D. Spreckles Cup for the endurance run from Los Angeles to San Diego, held on January 25 and 26, has been awarded to Charles A. Hawkins, who drove a White steam car carrying five passengers and fifty pounds of baggage.

In many of the popular sizes of tires the Diamond Rubber Company has not been able to make deliveries since November from the Akron factory or from the branch stores. But in the interim the company has been adding to its equipment and now announces that all business can be taken care of, the branch stores having again been completely stocked.

E. D. Winans, general manager of the Michelin Products Selling Company, Inc., a corporation which controls the sale of Michelin tires and products in the United States, reports that Michelin & Cie., the parent company, is doubling its plant in France, and that, when completed, the company will turn out about 1,600 tires a day. The American company will establish a factory in the United States this year, under a license from the parent company.

E. B. Gallaher, American agent for the Richard Brasier, has opened a Paris office at 11 Rue d'Alger, which will be in charge of a competent man familiar with all the principal languages. Automobilists touring in Europe may have their mail sent to this office for proper forwarding.

During the week of February 12 the Banker Brothers Company, of Pittsburg, will have an automobile show in which the New York displays of the cars which they represent will be reproduced. Chassis of the Pierce, Cadillac, Stevens-Duryea and Studebaker will be shipped there directly after the close of the Chicago show. These will be shown at the Bankers showrooms at 239-241 Diamond street, which will be opened for the first time on February 5. The company will also have the three Cadillacs which were exhibited in New York.

Samuel M. Miles, manager of the Chicago Automobile Show, gave a dinner to some of his newspaper and automobile friends at the Sherman House on Thursday evening, February 1; a number of other dinners will be given during show week.

The H. T. Hearsey Vehicle Company, of Indianapolis, has opened its new automobile annex and now has one of the largest garages in that city. It is located in a building just across from the offices and salesroom and has been equipped with all modern appliances for caring for and repairing motor cars. In addition to repairing and storing cars, the company will handle the

White, Pope-Waverley and Rambler lines for 1906. They have already had satisfactory sales on these cars this year.

The American Motor Car Company, of Indianapolis, is making its formal debut at the Chicago Automobile Show. The company has completed two cars, one of which was placed on exhibition, while the other is being used for demonstrating purposes. Fred I. Tone, the new general manager of the company, has charge of the Chicago exhibit.

The Atlas Automobile Company has secured the Pittsburg agencies for the Maxwell and Premier cars. The company's territory extends over western Pennsylvania, southern Ohio, western Maryland and West Virginia. Sub agents will be named at once.

The latest addition to Philadelphia's "row" is Connors & Gilmore, who, in addition to the Ratchet-Schneider cars, will handle a large line of automobile supplies. They have secured quarters at the southwest corner of Broad and Vine streets.

At the annual meeting of the Olds Motor Works directors were elected for the coming year as follows: H. B. Ledyard, Henry Russell, H. C. Potter Jr., and S. L. Smith, of Detroit; James H. Seager, F. L. Smith and Angus Smith, of Lansing. The officers are: President, Henry Russell; vice-president and general manager, F. L. Smith; secretary and treasurer, Angus Smith. Prospects for the largest business ever handled were reflected in the statement that advance bookings of orders amount to \$2,250,000.

The Dudley Automobile School of Boston has opened a branch in the Walker business block at Worcester to handle the Worcester county business. Already there are nearly 100 students enrolled, there being two lectures a week.

The polished chassis, which formed part of the Packard Motor Car Company's exhibit at the New York Madison Square Garden Show, has been sold by the company to Mrs. F. A. Fuller, of Paris, to whom the car will be shipped after the close of the Boston show. The machine is to be fitted with a body by Rothschild, of Paris.

The Newcomb Motor Company, 378 Jackson avenue, Long Island City, N. Y., has superseded the Commercial Motor Company and the Mercantile Motor Company, of Marion, N. J.

The Aerial car is to be represented in New York city by the Covell & Crosby Motor Company, located at 1621 Broadway.

Two orders for commercial vehicles recently closed by the Knox Automobile Company, of Springfield, Mass., were from the Fall River Bleachery for one of the company's three-ton trucks, and from the Fall River Gas Company for a No. 46 single-cylinder commercial car.

William Shrive, Yonkers, N. Y., agent for the Cadillac cars, recently completed his new garage at 64-66 Warburton avenue, that city.

The Standard Welding Company, of Cleveland, O., states that the Stanley steam racing car that made such a remarkable record at the Florida beach carnival was fitted with steel rims made by the Standard company.

Joseph Bentley, Methuen, Mass., has just placed on the market a high grade of curled hair especially adapted for use in auto cushions.

A salesroom and garage will be opened in Saginaw, Mich., at 114-116 South Franklin street, in the near future. The proprietor of the establishment, George J. Bohnet,

has secured the agency for the Reo cars for Saginaw and Bay City, Mich., his territory including the surrounding fourteen counties.

Recent purchasers of Locomobile cars include the mayor of Rochester, N. Y., James G. Cutler, and his brother, J. W. Cutler, and R. A. Sibley, of Rochester.

The Michigan State Tax Commission is making a crusade for the taxing of automobiles. It has sent a list of machines owned to the assessors of all cities with a request that they be placed on the tax rolls against the owners.

A consignment of a block-and-a-half-long string of Ford cars, en route to the Philadelphia branch of the company, attracted much attention on Broad street, that city, last Thursday.

Carl G. Fisher, the pioneer automobile man of Indianapolis, while at the New York shows placed an order for an airship to be built at a cost of \$3,000. Just what he intends to do with it is not known, but it is most unlikely that he will forsake the automobile for aerial navigation.

Israel Hoagland, an Indianapolis inventor, has perfected a motor to be used in plowing, and it is said that it can also be utilized to run farm machinery. The inventor is now in Chicago organizing a company to put the new machine on the market. Several progressive Indiana farmers have been running farm machinery by gasoline motors for some time. Last summer those who were sufficiently up-to-date to own automobiles ran their machinery with the automobile engine.

C. H. Saunders has opened a salesroom in the new Park Square Motor Mart, Boston, Mass., and will represent the Moline cars in New England.

The Babcock Electric Carriage Co. has arranged with the Decauville Automobile Co., of New York, whereby the latter will represent the Babcock company in Greater New York and northern New Jersey.

The garage of the Chelsea Auto Storage Co., located in New York at 516-520 West Thirty-seventh street, is devoted exclusively to the storage and repair of commercial vehicles, being fitted up especially for this branch of the industry.

Dolson automobiles will be represented throughout New England by the Imperial Automobile Co., with salesroom at 1024 Boylston street, Boston, Mass.

On March 1 a garage will be opened in Lexington, Ky., by C. Ora Updike, whose establishment will be ample to care for all tourists visiting the city, as well as local trade. A repair department, in charge of competent mechanics, will be a feature of the establishment.

Attention has been called to an error in the advertisement of the Elmore Manufacturing Company, of Clyde, Ohio, as it appears on page 174 of the January 18 issue of THE AUTOMOBILE. Obviously, as the text clearly indicates, the cylinders should be numbered 1, 3, 4, 2, in the sectional illustration of the Elmore engine, and not 1, 2, 3, 4, as they are numbered.

On Tuesday of this week the first shipments were made of the new steel wheels manufactured by the Iron Tire Pneumatic Wheel Company, 251 Fifth avenue, New York City. These wheels comprise a wheel within a wheel, a pneumatic ring or cushioning being interposed, while the outer rim is shod with a solid rubber tire, whereas the old experimental wheels, which were made by hand in a blacksmith shop, weighed 185 pounds each, the new ones as put on the market are asserted to weigh but 74 pounds. They are of 30 inches diameter; the larger diameters are not yet ready. A demonstrating run on a set of the new wheels is to be made between New York and Boston as soon as preparations can be made.

INFORMATION FOR BUYERS.

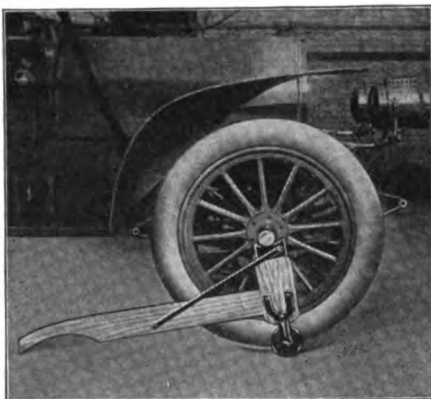
STORAGE IGNITION BATTERIES.—The storage batteries recently placed in the market by the New England Motor Co. of Lowell, Mass., are claimed to possess a high degree of efficiency combined with moderate cost. The company at present is offering two styles, a four-volt equipment and a six-volt, the respective weights, ready for use, being nineteen and twenty-seven pounds. The cells are put up in neat hardwood boxes thoroughly sealed and fitted with non-corrosive terminals. A leaflet is issued by the company describing the batteries and setting forth the advantages of the storage battery for ignition purposes as contrasted with other sources of electrical energy.

HOUSE ORGAN.—A new house organ has appeared in the *Reo Echo*, issued from the Reo Motor Car Co., of Lansing, Mich. The initial number is a robust journal and promises to promote the publicity of the already well known Reo line. The announcement of the publisher conveys the information that the *Reo Echo* will be issued at convenient intervals by the sales department of the company and that it will be sent free anywhere. In size the organ corresponds to other publications of a similar character and the thirty-two pages are filled with interesting items for the owner and the prospective purchaser. A number of pages are devoted to the *Reo Mountaineer*, with a number of illustrations of the varied experiences of Megargel and Fassett in the wilds of Arizona, and altogether the little magazine is replete with stories and facts of interest to automobilists in general.

GASOLINE HANDLING OUTFITS.—A complete catalogue of gasoline and oil tanks and pumps has been issued by the National Tank Co., of Dayton, O., manufacturers of self-measuring, computing and registering pumps and storage tanks. The outfits are made in all sizes, suitable for a small private garage or a large public establishment where large quantities of gasoline and oil have to be handled constantly. The pumps do their own measuring and indicate the

price of the quantity pumped; a discharge register keeps tally of the total number of gallons passing through the nozzle—a useful feature where large cans or tanks are being filled. The nozzle is made to avoid drip, and there is no waste or spreading of oil. An indicator shows the amount remaining in the tank at any time. Outfits are made with tanks and pumps separated as widely as may be desired, so that the tank may be in the cellar and the pump on a higher floor; or the tank may be underground, outside the building, and the pump in the building in a locked cabinet. Cabinets are made in all styles—roll tops, glass doors, all metal, square, round or any desired form.

GARAGE JACKS.—The advantages accruing from the practice of lifting the car, when not in use, so that there is no weight on the tires, is emphasized by the Bicycle and Stepladder Company, of 65 Randolph street, Chicago, in placing on the market a jack



GARAGE JACK SHOWING WHEEL RAISED.

designed especially for this purpose, and intended for garage use. The jack is simple and substantial in construction. It consists of a T-shaped structure of hard wood, the

long member of the T being the handle. One end of the head of the T carries a crotch to fit under the wheel hub, while the other carries a roller. In use the crotch is placed under the hub and the roller rests on the floor. Pressure is applied to the long handle, forcing the roller under the hub, at the same time raising the car. The roller passes under the center line of the hub and the handle then rests on the floor, making a firm support. The jacks are made in sets of four, one for each wheel, and are made in two styles—adjustable and semi-adjustable.

MILLER'S ANTI-FREEZE.—An anti-freezing compound for use in the cooling systems of gasoline automobiles is manufactured and sold by Charles E. Miller, of 101 Reade street, New York. The compound is put up in tightly closed ten-pound cans. Ten pounds of the compound added to two gallons of water will give a mixture which, it is claimed, will not freeze at 15 degrees below zero. Ten pounds to six quarts of water will resist a temperature of 30 degrees below zero. The radiator should be flushed with clean water before the compound is introduced, and care should be taken that there are no leaks.

MARINE ENGINE.—A new marine engine of moderate power has recently been placed in the market by Fairbanks, Morse & Co., of Chicago. It is designed for installation in small boats, yachts, luggers, etc., the motor being constructed on simple lines with the fewest possible parts and these accessible under all conditions of use. The motor is a single cylinder, four-cycle vertical engine with jump spark ignition and a rating of 4 1-2-horsepower. The crankshaft is constructed of nickel steel and the bearings are unusually ample for a motor of this size. The equipment supplied is large and covers nearly everything required for a power boat except the hull. It is the intention of the company to soon place another model in the market, a two-cylinder engine to bridge the gap between the new single-cylinder and its regular 10-horsepower marine motor.

INDEX TO ADVERTISERS

Acetylene Gas Illuminating Co.	39
Acme Motor Car Co.	104
Aerocar Co.	116
Albright Mfg. Co.	38
Am. Anti-Puncture Tire & Auto Co.	43
American Coil Co.	39
American Generator Co.	47
American Lubricator Co.	52
American Machine Mfg. Co.	42
American Shock Absorber Co.	82
American Veneer Co.	44
Anderson & Sons Co.	42
Archer & Co.	39
Ashton Valve Co.	39
Aster Co., L.	74
Atwood Mfg. Co.	37
Auburn Automobile Co.	97
Audel & Co.	45
Auto Pump Co.	39
Auto Top and Equipment Co.	40
Automobile Equipment Co.	43
Automobile Supply Co.	69
Badger Brass Mfg. Co.	90
Baker Motor Vehicle Co.	108
Baldwin Chain Mfg. Co.	72
Ball-Fintze Co.	52
Barnes Gear Co.	50
Bartholomew Co.	97
Beebe, A. M.	40
Bemis, T. Alton	41
Bentley, Joseph	40
Beverly Mfg. Co.	42

Blomstrom Motor Car Co., C. H.	100
Boker & Co., H.	40
Borbeln & Co., H. F.	44
Boston Cycle & Sundry Co.	38
Bowser & Co., S. F.	91
Boyer, Radford & Gordon Co.	52
Briscoe Mfg. Co.	42
Brown Mfg. Co., J. C.	46
Brown, R. E.	41
Brown & Co., S. N.	54
Brown Talbot Machine Co.	47
Buckeye Jack Mfg. Co.	71
Buckeye Mfg. Co.	110
Bullard Automatic Wrench Co.	Cover
Bullard, J. H.	52
Buob & Scheu	40
Burgin Bros.	38
Burlington Railway	43
Byrne-Kingston Co.	75
Cadillac Motor Car Co.	98
Capitol Foundry Co.	42
Carbondale Chemical Co.	38
Carr, S. F.	51
Central Park Auto Co.	56
Chalfonte Hotel	56
Champion Co., Albert	38
Champion Mfg. Co.	40
Chelsea Clock Co.	67
Cleveland Motor Car Co.	96
Collins & Sons, G. A.	40
Columbia Lubricants Co.	51
Columbus Buggy Co.	39
Connecticut Tel. & Electric Co.	41
Continental Caoutchouc Co.	79
Continental Motor Mfg. Co.	43
Corbin Motor Vehicle Co.	120
Correspondence School Auto Engineering	65
Covett Mfg. Co.	42
Crawford Automobile Co.	97
Cullman Wheel Co.	42
Cushing, J. M.	52
Dayton Electric Mfg. Co.	60
Decauville Auto Co.	62
Deere-Clark Motor Co.	113
Diamond Chain & Mfg. Co.	42
Diamond Rubber Co.	77
Dietz, R. E.	55
Diezemann Shock Absorber	59
Dixon Crucible Co., Joseph	44
Dolson Automobile Co.	99
Dorris Motor Car Co.	104
Douglass Andrews Co.	35
Dow Portable Electric Co.	39
Draper Bros. Co.	38
Duff Mfg. Co.	75
Duplex Coil Co.	49
E. H. V. Co., The	123
Eastern Carbon Works	50
Eclipse Buggy Co.	40
Edmunds & Jones Mfg. Co.	39
Elbridge Electrical Mfg. Co.	55
Eldredge Electric Mfg. Co.	38
Electric Rubber Mfg. Co.	48
Electric Vehicle Co.	101
Elmore Mfg. Co.	119
English Daimler Co.	47
Erie Railway	56
Excelsior Supply Co.	38
Fairmount Engineering Works	40
Fedders Mfg. Co.	52
Firestone Tire & Rubber Co.	37
Ford Motor Co.	38
Ford & Dennen	38
Forest City Motor Car Co.	94
Franklin Mfg. Co., H. H.	121
Franklin Portable Crane & Hoist Co.	47
G & J Tire Co.	76 and Cover
Gabriel Horn Mfg. Co.	68, 69
Garage Equipment Co.	40
Garford Co., The	59
Gearless Transmission Co.	80

Gilbert Mfg. Co.	44	Newmastic Tire Co.	44	Ultra Pump & Power Co.	48
Goodrich Co., E. F.	79	New England Motor Co.	61	Uncas Specialty Co.	50
Goodyear Tire & Rubber Co.	72	New Process Rawhide Co.	43	Upton Motor Co.	38
Gray-Hawley Mfg. Co.	73	New York and New Jersey Lubricant Co.	39		
Grout Bros. Automobile Co.	105 and Cover	New York School Auto Engineers.	38	Veeder Mfg. Co.	54
		New York Sporting Goods Co.	46	Vesta Accumulator Co.	68
Ham Mfg. Co.	61	Nicholsberg Mfg. Co., H.	46	Vitagraph Co.	39
Hardy Co., The R. E.	38	Nordyke & Marmon Co.	122	Vitrified Wheel Works.	42
Harris Oil Co., A. W.	63	Normandie Hotel.	56	Voigt, Em.	46
Harrison Wagon Co.	114	Northern Mfg. Co.	117		
Hartford Rubber Works	80	Nuttall Co., R. D.	42	Wabash Railroad.	45
Hartford Suspension Co.	39			Walker Co., E. C.	47
Hatcher Auto Parts Co.	98	Ofeldt & Sons.	40	Waltham Mfg. Co.	92
Havemeyer Oil Co.	38	Olds Motor Works.	124	Warner Instrument Co.	57
Hawkins Mfg. Co.	46	Oliver Mfg. Co.	70	Way Muffler Co.	85
Haynes Automobile Co.	125	Pacific Tucking & Mfg. Co.	46	Wayne Auto Co.	108
Healy Leather Tire Co.	45	Packard Electric Co.	40	Webster Mfg. Co.	58
Heinze Electric Co.	86	Packard Motor Car Co.	Cover	Weeber Mfg. Works, E. B.	43
Henry, Chester C.	50	Pantasote Co.	Cover	Welch Motor Car Co.	126
Herz & Co.	64	Parish & Bingham Co.	42	Wells Light Mfg. Co.	51
Hicks Speed Indicator Co.	52	Pedersen, J. T.	40	Western Oil Pump Co.	70
Hine-Watt Mfg. Co.	50	Peerless Motor Car Co.	115	Western Tool Works.	94
Hoffman, Geo. W.	38	Pennsylvania Rubber Co.	77	Weston Electrical Instrument Co.	39
Holley Bros. Co.	81	Pierce Engine Co.	112	Westrumite Co.	60
Hopson & Chapin Mfg. Co., The.	12	Pioneer Brass Works.	42	Wheeler & Schebler.	83
Hotchkiss, P. M.	33	Pneumatic Tire Protector Co.	46	Wheelock Motor Car Clock Co.	54
Hydraulic Oil Storage Distributing Co.	56	Pope Mfg. Co.	104	White Sewing Machine Co.	93
		Premier Motor Mfg. Co.	111	Whitney Mfg. Co.	49
		Prest-O-Lite Co.	60	Williams, E. Q.	70
				Wilson Auto Clock Co.	44
Imperial Brass Mfg. Co.	47	Railway Appliances Co.	69	Winkley Co., The.	49
Induction Coil Co.	68	Raines & Co.	59	Winton Motor Carriage Co.	Cover
Iroquois Motor Car Co.	99	Rainier Co., The.	102	Witherbee Igniter Co.	49
		Randall-Faichney Co.	50		
Janney, Steinmetz & Co.	42	Rapid Motor Vehicle Co.	107	York Hotel.	56
Jeffery & Co., Thomas B.	113	Remy Electric Co.	69		
Jersey Brake Co.	46	Robert Instrument Co.	48		
		Rock Island Battery Co.	71		
Kilgore Auto Air Cushion Co.	66	Rollins Mfg. Co.	67		
Kinsey Mfg. Co.	39	Royal Battery Co.	41		
Kirkham Motor Mfg. Co.	59	Royal Equipment Co.	72		
Knox Automobile Co.	111	Royal Motor Car Co.	99		
		Rushmore Dynamo Works.	65, 47		
Lee Mfg. Co.	97				
Lipman, C. E.	42	Samson Leather Tire Co.	87		
Lobee Pump Co.	42	Schug Electric Co.	47		
Locke & Co.	49	Scoville & Peck Co.	72		
Locomobile Co. of America, The.	95	Seidler-Miner Electric Co.	37		
Logan Construction Co.	103	Shaw, Ora D.	39		
London Auto Supply Co.	87	Shawver Co.	38		
Long Mfg. Co.	51	Sheddan Mfg. Co.	53		
Loomis Auto-car Co.	40	Sinks, Guy L.	43		
Loring, E. J.	39	Skinner & Skinner.	46		
Lozier Motor Co.	127	Smith, A. O.	51		
		Smith Auto Co.	118		
Madison-Kipp Lubricator Co.	42	Smith Co., D. B.	40		
Manhattan Lamp Works.	61	Smith Mfg. Co., R. H.	71		
Manning Mfg. Co.	40	Smith & Mabey.	128		
Matheson Motor Car Co.	112	Soules Motor Car Co.	98		
Maxwell-Briscoe Motor Co.	94	Speed Changing Pulley Co.	65		
McCord Mfg. Co.	46	Spicer Universal Joint Mfg. Co.	39		
McDonald, Wessels & Ames Co.	42	Splitdorf, C. F.	38		
Mendenhall, C. S.	45	Sprague Umbrella Co.	58		
Merritt Co.	39	Springfield Hat & Cap Co.	54		
Miami Pattern Works.	38	Springfield Metal Body Co.	40		
Michelin Tire.	78	Springfield Moulding Works.	44		
Middletown Auto Body Co.	40	Stachl & Co., L. E.	44		
Middleley Mfg. Co.	39	Stanley, John T.	57		
Miller, Charles E.	86	St. Louis Motor Car Co.	88		
Milwaukee Auto Engine & Supply Co.	44	Standard Connecting Rod Co.	54		
Milwaukee Steel Foundry Co.	42	Standard Foundry Co.	42		
Mitchell Motor Car Co.	103	Standard Welding Co.	31		
Moline Automobile Co.	110	Stearns, F. B.	40		
Moon Motor Car Co.	106	Steel Ball Co.	109		
Morgan, B.	39	Stevens Arms & Tool Co.	44		
Morgan & Wright.	78	Stitch-In-Time Vulcanizer Co.	54		
Mosler & Co., A. R.	39	Stolp Mfg. Co.	46		
Moss Photo Engraving Co.	71	Stone & Downer Co.	48		
Motor Car Equipment Co.	84	Stret Machine Co.	48		
Motor Car Specialty Co.	65	Supplementary Spiral Spring Co.	66		
Motor Car Supply Co.	42	Swinehart Clincher Tire & Rubber Co.	70		
Motor & Mfg. Works Co.	48	Syracuse Aluminum & Bronze Co.	42		
Motz Clincher Tire & Rubber Co.	74				
Mutty, L. J.	40	Thomas Motor Co., E. R.	109		
Myers-Dayton Top Co.	40	Timken Roller Bearing Axle Co.	73		
		Trebert Auto & Marine Motor Co.	45		
National Battery Co.	49	Trebert Gas Engine Co.	55		
National Brake & Clutch Co.	48	Tritt Electric Co.	38		
National India Rubber Co.	48	Tucker, C. F.	38		
National Motor Vehicle Co.	107	Tuthill Spring Co.	49		
National Tank Co.	34				
Neustadt Mfg. Co.	68				

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Advertisements inserted under this heading at 20 cents per line; about 7 words make a line. Remittance should accompany copy. Replies forwarded if postage is furnished.

A FEW GOOD AGENTS wanted for Jackson cars—We have some choice unoccupied territory in New York, New Jersey, and Pennsylvania in which we would like to secure live agents to push the sale of the Jackson Touring Cars. Three models: 24 H.P., \$1,250; 24 H.P., \$1,500; 45 H.P., \$2,500. Good proposition for agents. Write at once. Jackson Automobile Co., Lombardy St., Newark, N. J. **Marl**

CADILLAC F, latest 1906 model; condition in every respect guaranteed first-class. For price write Frank H. Blodgett, Janesville, Wis. **Feb15**

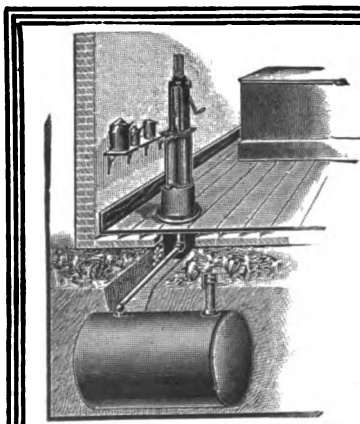
CHAUFFEUR, thorough mechanic, licensed, wishes position; willing to travel; Danish; A-1 references. Charles Adolphson, 1612 Fairmount avenue., Philadelphia, Pa. **Feb15**

CHAUFFEUR, Italian, experienced, good reference, and license, desires position with private family going to Milan Exposition, or anywhere. V. Montalbino, 73 Lakeside Ave., West Orange, N. J. **Feb8**

DRAUGHTSMAN, technical graduate, thoroughly familiar with the automobile line, can take charge of the entire design and construction; wants situation; good reference. A. L. P., care The Automobile. **Feb8**

FOR SALE—1906 Model K Winton, run one week. W. P. Hulbert, 216 E. 3d St., Cincinnati, O. **Feb8**

FOR SALE—15-tube radiator, \$10; 24-tube, \$15. A. M. Symonds, 901 No. Fairfield Ave., Chicago Ill. **t.f.**



THE NATIONAL GASOLINE TANKS

☛ The National Long Distance Gasoline Storage Outfit, which permits of placing the supply tank under ground, the pump being inside the building. In perfecting this outfit we have observed to the letter the rules of the underwriters' Laboratories, and can recommend it to be the safest and most economical way of handling gasoline ever devised. ☛ This pump is one of our latest, Double Cylinder, which in operating there is no lost motion, every movement of the handle pumps and measures oil, saving time, labor and money. ☛ This outfit is especially designed for Automobile Garages. ☛ Ask for Catalogue.

THE NATIONAL TANK CO., Inc., DAYTON, OHIO

THE AUTOMOBILE

VOL. XIV.

NEW YORK—THURSDAY, MARCH 8, 1906—CHICAGO

No. 10

BOSTON WILL HAVE A GREAT SHOW



BOSTON, March 5.—Emphasizing the enduring foundations of a great industry, presented in an effective setting, and embracing all that is of and related to automobiling, the New England contribution to the show circuit will be opened to the expectant public Saturday evening. Motor boats too, will have a substantial place in the record-breaking affair.

Though this annual automobile and power boat show of the Boston Automobile Dealers' Association will be set in motion Saturday evening in Mechanics Building, this opening will not include the entire exhibition by any means. A year ago Mechanics Building, the largest exhibition structure in New England, was sufficient to house the exhibition, and it was expected that it would be of sufficient size this year. But some months ago, after practically every available foot of space in the big halls had been sold, it was found that all the manufacturers and dealers in automobiles and power boats could not be accommodated. The management then secured Symphony hall, the building which last year was used for an importers' show. This is the home of the famous Boston Symphony orchestra which gives weekly concerts on Saturday evenings. On account of the concert the hall cannot be used until Monday, and therefore that section of the show will not be opened until Monday.

In making preparations for the show the committee, consisting of George H. Lowe, E. A. Gilmore, and J. H. MacAlman, and the manager, Chester I. Campbell, have worked untiringly, and they promise that the exhibition not only will be up to the standard of former Boston exhibitions, but will eclipse everything else in this country. The idea of decorating for automobile shows originated and was first put in prac-

tice in this city. Other places have copied and elaborated upon this plan, and while in expense of decorations the Boston show may be eclipsed by the Madison Square show in New York, the show committee promises something novel in the way of decorations. The general scheme is for a pergola effect in the main halls of Mechanics Building, with uniform decorations, and signs in red and green. The exhibition spaces will all be carpeted, and will be separated from each other by draperies.

In Mechanics Building the street floors will be devoted exclusively to automobiles, and this year the displays in Exhibition hall will be of equal quality. To obtain additional space the management had removed the banks of seats in the balcony of Grand Hall, and a number of prominent manufacturers will exhibit there. In addition to this, the upper gallery in Grand hall, which has not been used heretofore, will be devoted to accessories. Other accessories exhibits will be in the balcony of Exhibition hall, and there will also be some cars in this section.

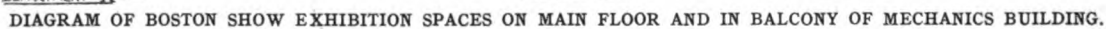
The basement is devoted primarily to motor boats, and practically all the leading builders in the country have engaged space and will show their product. Some of the space which was not required for the motor boats has been sold to automobile manufacturers and dealers, so that the automobile show will include a part of the motor boat department.

In Symphony hall the main floor has been divided into large spaces that have been taken by automobile concerns which put in their applications too late to secure space in Mechanics hall. There will be also exhibits of accessories in Symphony hall, which will be decorated after an entirely different scheme from the other building. A new feature of the show this year will be the introduction of band concerts afternoons and evenings in Mechanics Building.

For the accommodation of the throngs which are expected in Boston during the week of the show, the hotels and railroads are making special preparations. Excursions at special rates will be run to Boston from all parts of New England, and already many of the rooms in the leading hotels near the show buildings have been engaged by exhibitors and others coming from a distance. For the entertainment of the visiting automobilists, the Bay State Automobile Association has engaged special quarters in the Copley Square hotel, near Mechanics Building, and the Massachusetts Automobile Club, whose clubhouse on Boylston street, is very near the show buildings, is making special preparations to entertain the friends of members.

List of Exhibitors

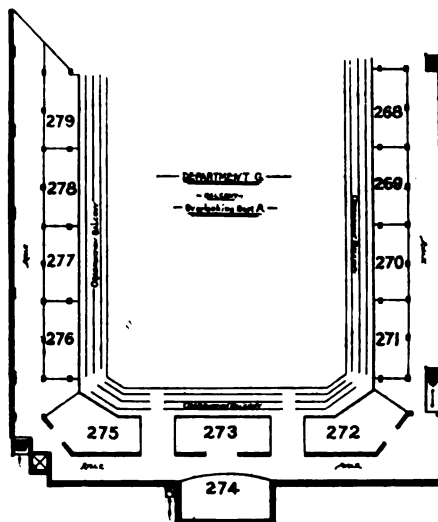
1. Peerless Motor Car Co., 178 Columbus Ave., Boston.
2. A. R. Bangs—Franklin, Darracq—801 Boylston St., Boston.
3. Geo. J. Dunham—Royal Tourist—182 Columbus Ave., Boston.
4. Winton Motor Carriage Co., 1 Stanhope St., Boston.
5. White Sewing Machine Co., 320 Newbury St., Boston.
6. Reed-Underhill Co.—Knox, Stearns—222 Columbus Ave., Boston.
7. Moore & Smith—Autocar—38 Columbus Ave., Boston.



8. Napier Co. of America, 743 Boylston St., Boston.
9. White Sewing Machine Co., 320 Newbury St., Boston.
10. Reed-Underhill Co.—Knox, Stearns—222 Columbus Ave., Boston.
11. A. T. Fuller—Packard, Cadillac—Motor Mart, Columbus Ave., Boston.
12. Boston Automobile Exchange—Crawford, Columbus—173 Berkeley St., Boston.
13. Pope Mfg. Co.—Pope-Toledo, Pope-Hartford, Pope-Tribune, Pope-Waverley—223 Columbus Ave., Boston.
14. Randliff Motor Car Co.—Panhard, Stoddard-Dayton—Boston.
15. A. T. Fuller—Packard, Cadillac—Motor Mart, Columbus Ave., Boston.
16. K. A. Skinner—De Dion-Bouton—179 Clarendon St., Boston.
17. Pope Mfg. Co., 223 Columbus Ave., Boston.
18. J. W. Maguire Co.—Pierce, Baker—745 Boylston St., Boston.
19. "The Automobile," Flatiron Building, New York.
20. Benjamin Smith—special car—319 Columbus Ave., Boston.
21. Geo. M. Brown—Apperson—43 Columbus Ave., Boston.
22. Mills Kennedy Co.—Welch—733 Boylston St., Boston.
23. Boston Motor Co.—Acme, Merkel—43 Columbus Ave., Boston.
24. Jenkins & Sheldon—Mitchell—304 Columbus Ave., Boston.
25. E. T. Kimball Co.—Corbin—Motor Mart, Columbus Ave., Boston.
27. Motor Age, 309 Michigan Ave., Chicago.
28. Cycle and Automobile Trade Journal, 1213 Filbert St., Philadelphia.
29. Providence Tribune, Westminster St., Providence.
30. Motor Way, 21 Quincy St., Chicago.
31. Boston Globe, Washington St., Boston.
32. Boston Herald, Washington St., Boston.
33. Boston Transcript, Boston.
34. Providence Journal, Providence, R. I.
35. Motor World, 154 Nassau St., New York.
36. Boston American, Boston.
37. Banker and Tradesman, Franklin St., Boston.
38. Motor, 1789 Broadway, New York.
39. E. P. Blake & Co.—Jackson—Motor Mart, Boston.
- 40, 41. Ford Motor Car Co., 149 Columbus Ave., Boston.
- 42, 43. E. S. Breed—Haynes, Elmore—41 Columbus Ave., Boston.
- 44, 45. Butler Motor Car Co.—Cleveland, Richard-Brasier—Pierce—998 Boylston St., Boston.
46. Horseless Age, 9-15 Murray St., New York.
47. Sturtevant Mill Co., Harrison Square, Boston.
48. Jordan Marsh & Co., Boston.
49. S. F. Bowser & Co., 255 Atlantic Ave., Boston.
50. D. W. Dunn, 43 Federal St., Boston.
51. American Electric Novelty Mfg. Co., Hudson St., New York.
52. The Angler Co., 735 Boylston St., Boston.
53. Thos. B. Jeffery & Co., 145 Columbus Ave., Boston.
- 55, 56, 57. Harry Fosdick Co.—Flat, Studebaker—53 Stanhope St., Boston.
- 58, 59, 60. Locomobile Co. of America, 15 Berkeley St., Boston.
- 61, 62. Columbia Motor Vehicle Co.—Columbia—94 Stanhope St., Boston.
- 63, 64, 65. Linscott Motor Co.—National, Reo—163 Columbus Ave., Boston.
- 66, 67, 68. Morrison-Tyler Motor Car Co.—Maxwell, Ranier, Marion—Massachusetts Ave., Boston.
69. Essex Motor Car Co.—Essex steam car—60 State St., Boston.
- 70, 71. Wayne Automobile Co. of New England, 509 Tremont St., Boston.
- 72, 73. Gray & Davis, Amesbury, Mass.
74. Baker-Comerals Motor Car Co.—Premier—Massachusetts Ave., Boston.
75. Randliff Motor Car Co.—Frayer-Miller, Ardsley—Boston.
76. Hendee Mfg. Co., Springfield, Mass.
77. Berkshire Automobile Co., Pittsfield, Mass.
- 78, 79. C. S. Henshaw—Thomas—288 Columbus Ave., Boston.
- 80, 81. Linscott Motor Car Co.—National, Reo—163 Columbus Ave., Boston.
82. Autobed Co., 36 Columbus Ave., Boston.
83. Matheson Motor Car Co., Holyoke, Mass.
84. Adams-Sutton Motor Co.—Olds—16 Columbus Ave., Boston.
- 85, 86. Buick Auto Agency, 541 Tremont St., Boston.
88. Adams-Sutton Motor Car Co., 16 Columbus Ave., Boston.
89. Matheson Motor Car Co., Holyoke, Mass.
90. National Carbon Co., Cleveland.
- 91, 92, 93. Waltham Mfg. Co., Waltham, Mass.
94. Reed-Underhill Co., 222 Columbus Ave., Boston.
- 95A. Veeder Mfg. Co., Hartford, Conn.
- 95B. Uncas Mfg. Co., 37 Shipping St., Norwich, Conn.
- 96, 97. Adams-Sutton Motor Co.—Olds commercial cars—Motor Mart, Boston.
98. Page Motor Vehicle Co., 127 Summer St., Providence.
99. Post & Lester Co., Hartford, Conn.
100. Moore-Smith & Co., 250 Devonshire St., Boston.
101. Alden Spear's Sons Co., 369 Atlantic Ave., Boston.
102. Peter Gray & Sons, 90 Union St., Boston.
- 103, 104. Boston Cycle & Sundry Co., 47 Hanover St., Boston.
105. Chas. E. Miller, 97 Reade St., New York.
- 105A. Harris Oil Co., Providence, R. I.
106. Albert Champlon Co., 541 Tremont St., Boston.
107. Motor Car Specialty Co., Trenton, N. J.
- 110, 111. Atwood Mfg. Co., Amesbury, Mass.
112. A. W. Chesterton & Co., 64 India St., Boston.

113. Gilbert Mfg. Co., 76 Center St., New Haven, Conn.
 114. Jones Speedometer, 127 W. 32d St., New York.
 115. Whitney Mfg. Co., Hartford, Conn.
 116. Eco Mfg. Co., 43 Columbus Ave., Boston.
 117. E. B. Badger & Sons Co., 51 Pitts St., Boston.
 118. 119A. Gilbert & Baker Mfg. Co., 51 Union St., Boston.
 119B. 120 Firestone Tire & Rubber Co., Park Sq., Boston.
 121. Faulkner Mills Co., 4th & Spring Sts., New Bedford, Mass.
 122. C. F. Whitney, 43 Columbus Ave., Boston.
 123. Wm. Hjorth, Jamestown, N. Y.
 124. Tire and Motor, 150 Nassau St., New York.
 125. Iron Tire Pneumatic Wheel Co., 259 Fifth Ave., New York.
 126. Hicks Speed Indicator Co., 1384 Bedford Ave., Brooklyn, N. Y.
 127. Healy Leather Tire Co., 88 Gold St., New York.
 128. Hutchinson Electric Horn Co., 1 Madison Ave., New York.
 129. Columbia Road Auto Station, 610 Columbia Road, Dorchester, Mass.
 130. Geo. W. Knowlton Rubber Co., 88 Broad St., Boston.
 131, 132. Manhattan Storage Co., 42 Cortlandt St., New York.
 133. Boston Insurance Co., 137 Milk St., Boston.
 134. Electric Storage Battery Co., 60 State St., Boston.

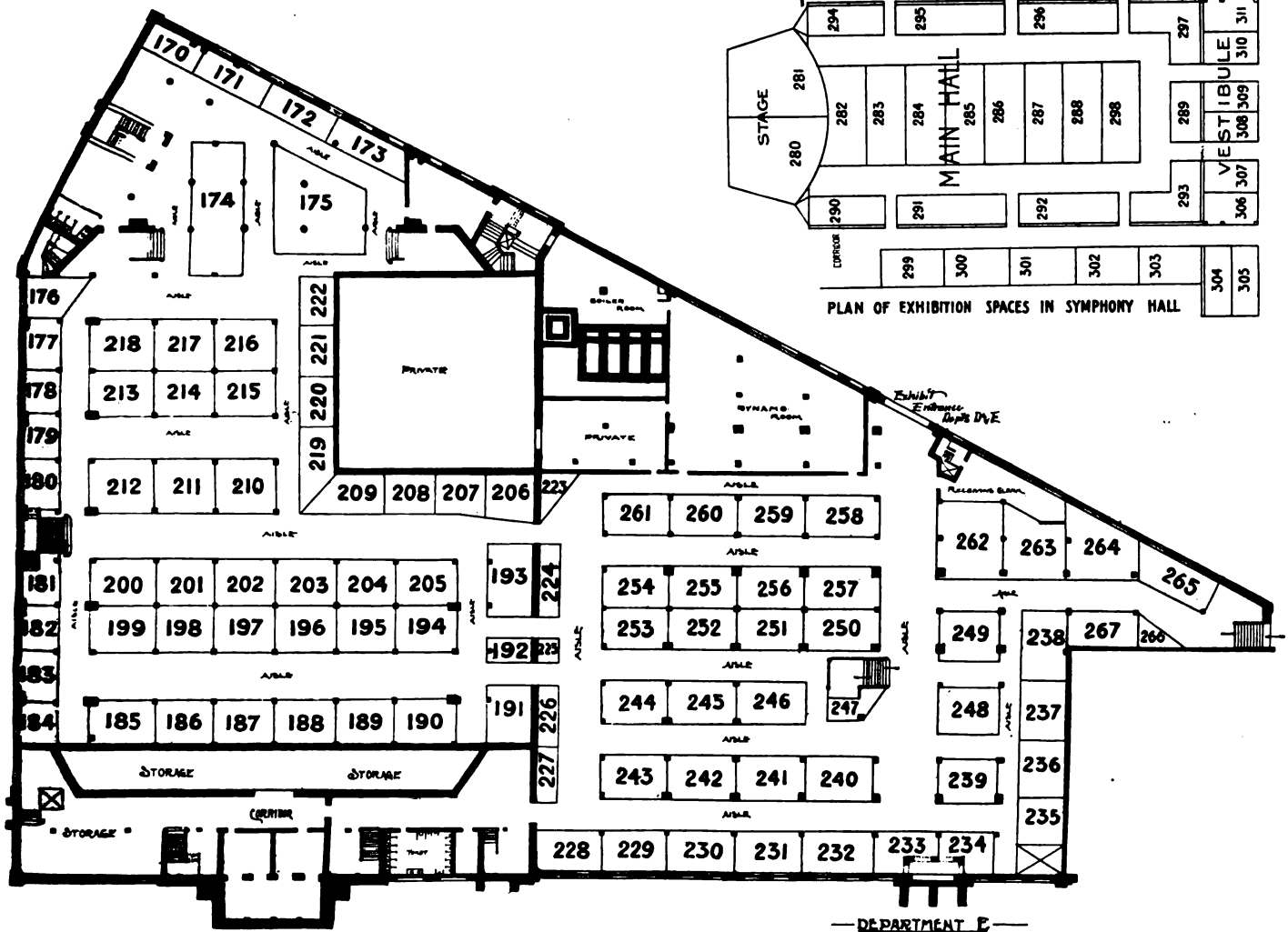
135. Andrew J. Lloyd & Co., 315 Washington St., Boston.
 136. Crouch Motor Co., Stoneham, Mass.
 137. Samson Leather Tire Co., New York.



BALCONY SPACES IN MECHANICS BUILDING.

- 138A. Eastern Carbon Works, Carbon Place, Jersey City.
 138B. Conn Telephone & Electric Co., Meriden, Conn.

- 139 to 143. P. A. Murray, Washington St., Newton, Mass.
 144. Columbia Vehicle Tire Co., 97 Haverhill St., Boston.
 145. Baum's Castorine Co., 43 Columbus Ave., Boston.
 146. McGlehan Mfg. Co., New York.
 147. C. Cowles & Co., Walter and Chestnut Sts., New Haven, Conn.
 148. A. N. Greenwood Oil Co., 71 High St., Boston.
 149. Randall-Falchney Co., Sudbury Bldg., Boston.
 150. E. J. Loring, 76 Highland Ave., Somerville, Mass.
 151. Hillman Plating Co., 38 Chardon St., Boston.
 152. Anderson Spark Plug Co., 701 Colonial Bldg., Boston.
 153. Iron Clad Mfg. Co., Brooklyn, N. Y.
 154. Tokheim Mfg. Co., 304 Varet St., Brooklyn, N. Y.
 155. Rands Mfg. Co., Detroit, Mich.
 156. Boston Auto Gauge, 613 Old South Bldg., Boston.
 157. Williams Mfg. Co., 309 Washington St., Boston.
 158. Nelson Whitney, 651 Old South Bldg., Boston.
 160. Vacuum Oil Co., 101 Milk St., Boston.
 161A. Dover Stamping Mfg. Co., 385 Putnam St., Cambridge, Mass.
 161B. Eagle Oil & Supply Co., 104 Broad St., Boston.



—DEPARTMENT D—
 DIAGRAM OF BOSTON SHOW EXHIBITION SPACES IN SYMPHONY HALL AND IN BASEMENT OF MECHANICS BUILDING.



BOSTON'S PICTURESQUE AND NUMEROUS SUBURBS POSSESS MILES OF ROADS TO ENCOURAGE AUTOMOBILING.

162. Trident Wheel Co., 84 State St., Boston.
 163, 164. Leon Rubay, 140 W. 38th St., New York.
 165. Globe Optical Co., 396 Washington St., Boston.
 166. Rollins Mfg. Co., 279 Washington St., Boston.
 167. Consolidated Mfg. Co., Toledo, O.
 168. Hartford Suspension Co., 67 Vestry St., New York.
 169. Rose Mfg. Co., 910 Arch St., Philadelphia, Pa.
 170, 175. The Atlantic Co. — launches, dories and yacht tenders—Amesbury, Mass.
 176A. Perkins Launch & Motor Co., 81 E. Main St., Gloucester, Mass.
 176B. C. H. Saunders, Motor Mart, Boston.
 177. Chas. H. Coops, 3 Appleton St., Boston.
 178. Pantasote Leather Co., 11 Broadway, New York.
 179A. Power Boat News, New York.
 179B. The Rudder, New York.
 180. Camden Anchor-Rockland Mch. Co., Rockland, Me.
 181. Thos. Prosser & Son, 15 Gold St., New York.
 182. Chas. P. McClellan, Fall River, Mass.
 183. Fuller & Sullivan, 19 Elliot St., Boston.
 184. Main Woods & Main Woodsman Pub. Co., Phillips, Me.
 185. Joseph B. Emerson, Auburndale, Mass.
 186, 187. Sprague Umbrella Co., Norwalk, Ohio.
 188A. Motor Boat, New York.
 188B. Bay State Hardware Co., 1321 Washington St., Boston.
 189, 190. E. Teel & Co., Medford, Mass.
 191. J. N. Leach—G. H. Proctor Supply Co.—Melrose Automobile Co.—Motor Mart, Boston.
 192. Wm. Cramp & Son Ship & Eng. Bldg. Co., Philadelphia, Pa.
 193. Buffalo Gasoline Motor Co., P. O. Sq. Bldg., Boston.
 194. E. Gerry Emmons Corp., 33 Haverhill St., Boston.
 195. Knox Motor Truck Co., Springfield, Mass.
 196. Briggs & Wade, 76 Sagamore St., Lynn, Mass.
 197, 198. Vehicle Equipment Co., Long Island City, N. Y.
 199. Mitchell Punctureless Pneumatic Tire Co., Swampscott, Mass.
 200. Hall Gasoline Engine Co., Wollaston, Mass.
 201. McFarland Foundry & Machine Works, Trenton, N. J.
 202. Butler Motor Car Co.—"Rapid" trucks—998 Boylston street, Boston.
 203. Pope Mfg. Co., 223 Columbus avenue, Boston.
 204. Knox Motor Truck Co., Springfield, Mass.
 205. E. Gerry Emmons Corp., 33 Haverhill street, Boston.
 207. W. H. Mullens Co., Salem, O.
 208. John L. Snow, 178 Columbus avenue, Boston.
 209. Geo. A. Gulliford, 303 Eastern avenue, Lynn, Mass.
 210 to 212. A. S. Morss Co., 210 Commercial St., Boston.
 213. Waltham Boat & Canoe Co., Waltham, Mass.
 214. Chas. Holmes Machine Co., 289 Marginal St., E. Boston, Mass.
 215. Gearless Transmission Co., Glens Falls, N. Y.
 216, 217. C. H. Saunders—Moline—Motor Mart, Boston, Mass.
 218. A. J. Coburn—Upton Constant Electric—43 Columbus Ave., Boston.
 219, 220. Chandler & Farquhar, 36 Federal St., Boston.
 221. Norton Emery Wheel Co., 237 Chandler St., Worcester, Mass.
 222. Coates Clipper Mfg. Co., Worcester, Mass.
 223. Hasbrouck Motor Co., New London, Conn.
 224. V. J. Emery, Wollaston, Mass.
 225. Monitor Electric Speed Recorder Co., Cambridge, Mass.
 226. Palmer Bros., 85 Union St., Boston.
 227. A. W. Toppan, 9 Haverhill St., Boston.
 228. D. M. Tuttle & Co., Canastota, N. Y.
 229. Walter J. Forbes, 220 Congress St., Boston.
 230. Lamb Boat & Engine Co., Clinton, Ia.
 231 to 234. Murray & Tregurtha Co., So. Boston, Mass.
 235. Boston Gasoline Engine Co., 88 Broad St., Boston.
 236. R. M. Kimball—Harvard Marine & Auto Co.—25 Elliott St., Cambridge, Mass.
 237, 238. Baker Yacht Basin, Inc., Quincy, Mass.
 239. J. V. Rice, Jr., Co., Bordentown, N. J.
 240 to 243. A. W. Toppan—standard Autos. Toppan Mfg. Co.—9 Haverhill St., Boston.
 240 to 243. A. W. Toppan—Standard Automobiles, Toppan Mfg. Co.—9 Haverhill St., Boston.
 244. Detroit Boat Co., Detroit, Mich.
 245. Michigan Steel Boat Co., Detroit, Mich.
 246. Detroit Engine Works, Detroit, Mich.
 247. L. E. Bova, South Station, Boston.
 248. Hub Automobile Exchange, 191 Freeport St., Dorchester, Mass.
 249. Swasey, Raymond & Page, 621 Colonial Bldg., Boston.
 250. Walter Coleman Sons, 300 Water St., Providence, R. I.
 251. Fairbanks Co., 42 Pearl St., Boston.
 252. Brown-Talbot Mch. Co., 438 Old South Bld., Boston.
 253. Cooley Mfg. Co., 146 Franklin St., Boston.
 254. Goodwin Bros., Riverside Ave., Medford, Mass.
 255. Brown-Talbot Mch. Co., 438 Old South Bldg., Boston.
 256. Olds Gasoline Engine Works, 69 Washington St., N. Boston.
 257. E. F. Hodgson, Dover, Mass.
 258. Arthur F. Binney, 70 Kilby St., Boston.
 260. Essex Engine Co., Lynn, Mass.
 261. Carlyle-Johnson Mch. Co., Hartford, Conn.
 262. Springfield Moulding Works, Springfield, Mass.

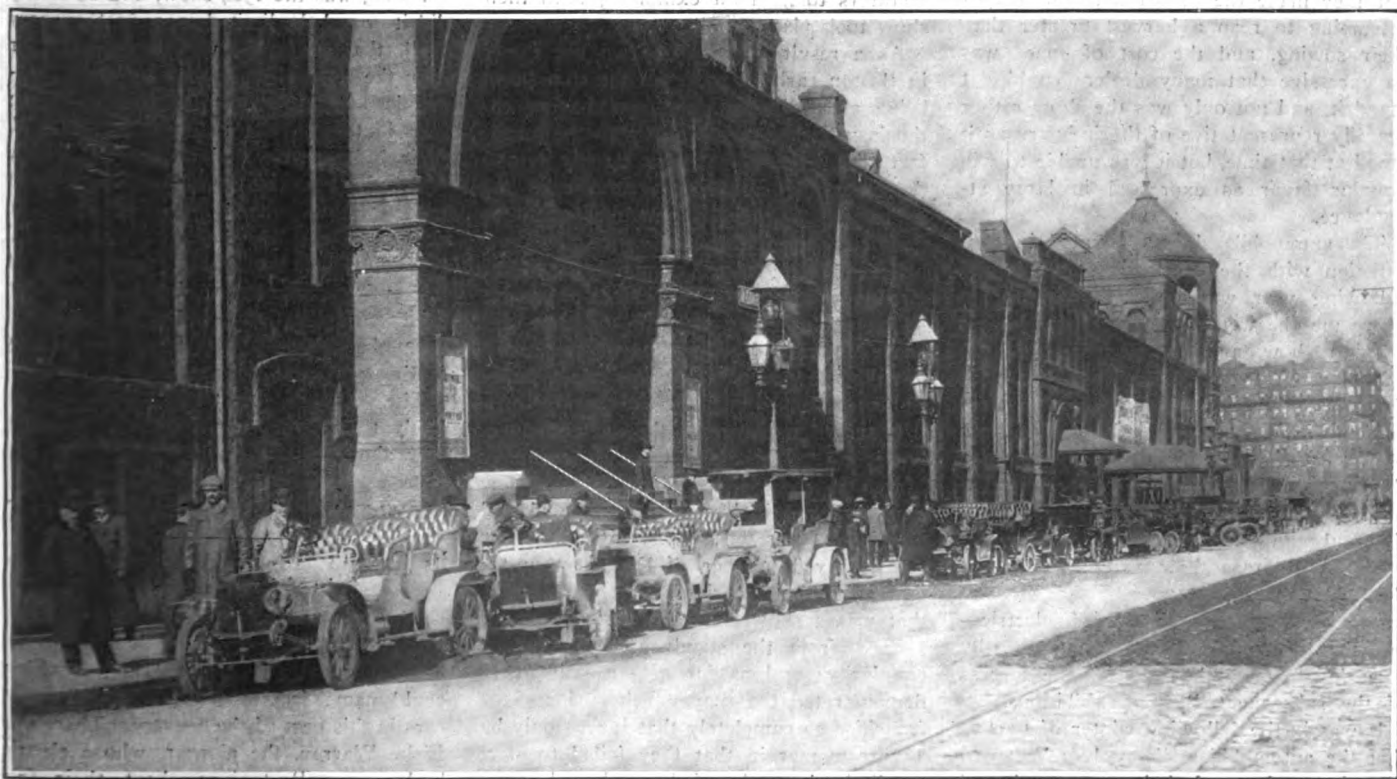
263. Automatic Mach. Co., Bridgeport, Conn.
 264. A. E. Wells & Sons, 53 Puritan Road, Swampscott, Mass.
 265. F. E. Davis, 280 Devonshire St., Boston.
 266. Richardson Engineering Co., 36 Pearl St., Hartford, Conn.
 267. Norfolk Motor Co., Wallaston, Mass.
 Aisle. Hollis Burgess, 10 Tremont St., Boston.
 268. Louis S. Ross, Craft St., Newtonville, Mass.
 268B. Sage Trunk Depot, 81 Summer St., Boston.
 269A. H. P. Coleman—Duryea—66 Stanhope St., Boston.
 269B. Old Colony Light Co., 241 Boylston St., Boston.
 270A. R. E. Dietz & Co., 60 Laight St., New York.
 270B. Boston Tire & Rubber Co., 184 Friend St., Boston.
 271. Corwin Mfg. Co.—Gasaulec—Peabody, Mass.
 272. F. E. Wing & Co.—Marmon—Motor Mart, Boston.
 273. Imperial Auto Co.—Aerocar, Dolson, St. Louis, Argus, Martini—1024 Boylston St., Boston.
 274. Imperial Auto Car, 1024 Boylston St., Boston, Mass.
 275. St. Louis Motor Car Co., Peoria, Ill.
 276. Grout Bros. Automobile Co., Orange, Mass.
 276A. American Motor Car Co., 70 Kilby St., Boston.
 277B. Gabriel Horn Mfg. Co., Cleveland.
 278A. The Duquesne Co., 112 E. 76th St., New York.
 278B. Way Muffler Co., Arch St., Philadelphia.
 Aisle. Jacobs Mfg. Co., 172 Pearl St., Hartford, Conn.
 279. Babcock Electric Carriage Co., Buffalo.
 SYMPHONY HALL.
 280. Stanley Motor Car Co., Newton, Mass.
 281. Stanley Motor Car Co., Newton, Mass.
 282. C. H. Blomstrom Motor Co., Detroit.
 283. Shawmut Motor Co., 901 Boylston St., Boston.
 284. H. C. Stratton & Co.—American Mercedes—43 Columbus Ave., Boston.
 285. Johnson Service Co., Milwaukee.
 286. Mors Automobile Co. (A. L. Bennett) 541 Tremont St., Boston.
 287. Mercedes Import Co., Times Bldg., New York.
 288, 289. English Daimler Co.—C. G. V., Decauville—Times Bldg., New York.
 290, 291. Northern Automobile Agency, Motor Mart, Boston.
 292A. Pennsylvania Rubber Co., 167 Oliver St., Boston.
 292B. Photo Era Publishing Co., 383 Boylston St., Boston.
 293A. Salisbury Tire Co., Owosso, Mich.
 293B. Voorhees Rubber Co., 18 Bostwick Ave., Jersey City, N. J.
 294. Crown Motor Car Co.—Glide—Motor Mart, Boston.
 295. Elsenhuth Horseless Vehicle Co.—Compound—Middletown, Conn.
 296. Iver Johnson Sporting Goods Co., Boston.
 297. Iroquois Motor Car Co., Seneca Falls, N. Y.
 298. D. R. Nichols & Co.—Edw. S. Clark. Clark Steam Car—116 W. Brookline St., Boston.
 299A. A. H. Fuller, 60 Main St., Brockton, Mass.
 299B. H. E. Whiting, 61 Ware St., Cambridge, Mass.
 300B. Underhay Oil Co., 78 Batterymarch St., Boston.
 301A. H. J. Russell, 32 Exchange St., Worcester, Mass.
 301B. Electric Rubber Mfg. Co., Rutherford, N. J.
 302A. J. H. Bullard, Springfield, Mass.
 302B. Wells Light Mfg. Co., 44 Washington St., New York.
 303A. Wm. C. Robinson & Son Co., 141 Milk St., Boston.
 303B. Aetna Life Insurance Co., Kilby and Water Sts., Boston.
 304, 305. L. E. Bova, South Station, Boston.
 306A. Commonwealth Magazine, Boston.
 306B. L. C. Chase & Co., 129 Washington St., Boston.
 307A. Fischer & Kuehner, Providence, R. I.
 307B. American Metal Polish Co., 89 Winlow St., Somerville, Mass.
 308. Detroit Auto Vehicle Co., Detroit.
 309A. Kilgore Auto Air Cushion Co., 46 Columbus Ave., Boston.
 309B. Dodge Lubricator Co., Columbus Ave., Boston.
 310. Equitable Distributing Co., 24 Columbus Ave., Boston.
 311. Jos. B. McMillen, Elliot City, Md.
 314. Dow Portable Electric Co., Braintree, Mass.
 315. Harrison Wagon Co., Grand Rapids, Mich.
 316. Heinze Electric Co.—New England Motor Co.—Lowell, Mass.
 317A. E. B. Belcher, 26 Green St., Malden, Mass.
 317B. Oil Tempering Spring Co., 152 Main St., Chicopee Falls, Mass.
 318. Auto Goods Co., 425 Butler's Ech., Providence, R. I.
 Entrance, O'Brien & Russell, 108 Water St., Boston.

BOSTON'S SHOW HISTORY.

Automobiles Were Exhibited in Mechanics Building in 1898.

When was the first automobile show in Boston? If one out of fifty of the auto enthusiasts who crowd into the Boston show next week can answer this question off-hand, it will be a miracle. Of course, almost everybody who has followed the "game" will be apt to say that the first show that was a show was in 1903, when the Boston Automobile Dealers' Association gave their first exhibition with such glowing success.

But that wouldn't be the truth. The facts are that the first real automobile show



AS THE GREAT BOSTON SHOW IN THE MECHANICS BUILDING PROSPEROUSLY LOOKED A YEAR AGO.

in Boston was a part of another show—the Mechanics' Fair—which has been run every year or two by the Massachusetts Charitable Mechanics' Association for several decades. That association took special cognizance of the growing interest in automobiles as early as 1898, and in November of that year, at its regular exhibition in Mechanics Building—a general exhibition comprising all sorts of industrial machinery—gave the basement of the building to automobiles. The old Whitney steam carriage, the Stanley steamer, and one or two specials were the principal vehicles exhibited; but the gasoline type was represented by the old Duryea car, which at that time had headquarters in Springfield, Mass. Yet it was not in the exhibition itself that this display attracted attention so much as in a competition arranged to take place at Charles River Bicycle Park, Cambridge, to show what the "horseless carriages" were good for in actual service.

At subsequent industrial shows in Mechanics Building there was an attempt made to give some space to automobiles, but none of them attracted much attention and in 1902, when a club had been started in Boston and there were a number of regular dealers in the city, all interests combined to make the automobile end of the Mechanics' Fair the big thing of the exposition. Meantime, however, in 1901, a number of professional show promoters dropped down on Boston with a proposal for an automobile show all by itself. They interested all the automobile owners and dealers in the scheme, and eventually held their exhibition in the Mechanics Building, March 4 to 9, 1901; but they made the unfortunate mistake of attempting to reap a harvest greater than their sowing, and the cost of space was so excessive that many dealers could not stand it, and not only was the show rather scantily representative of the industry as it stood at that time, but it was unable to win popular favor as expressed in large attendance.

The automobile show attempted in conjunction with the Mechanics' Fair in the following year was undertaken partly to overcome the wet-glove effect of this first all-auto show, and the ill-success of the other contributed to the general success of the 1902 exhibition. Clubmen and dealers combined with cars and influence, and not only for the exhibition itself, but also for the street parade conducted in connection with it, was there ample newspaper mention and notable interest among the general public. That 1902 show made it evident to the public that three types of cars were in existence—steam, gasoline, and electric—and that show did more than is generally conceded to pave the way for the success of the subsequent Boston exhibitions.

It was in the following winter of 1902-03 that the automobilists themselves began to plan for a show of their own, conducted by them and for them. The club coterie,



BOSTON'S FASHIONABLE TEMPLE OF MUSIC LOANED FOR INDUSTRIAL PURPOSES.

organized what was known as the New England Automobile Association, and in the name of this association obtained an option on the main hall of Mechanics' Building for the same week in February, 1903, as that for which the secondary hall of the building was to be given over to the dog show of the New England Kennel Club. This forestalled the dealers, several of whom thereupon quietly formed the Boston Automobile Dealers' Association and secured an option on the beautiful new Symphony Hall for the week of March 16 to 21 and set about getting dealers and manufacturers to hold off exhibiting until their show took place.

As a result, there were two big shows in Boston early in 1903, but the club show, being at a disadvantage from having enthusiasm rather than a pull with the manufacturers, turned its show largely into a demonstration of the marvelous ease and delicacy with which automobiles could be handled. The cutting of figure "8" on a polished floor, see-saw exhibitions, and the circling of the hall with carloads of would-be buyers occupied most of the time and proved attractive to crowds of spectators, but the show as a whole was not a financial success.

It served to advertise the dealers' show, however, and when this show opened in March it showed a hallful of handsome cars arranged in luxuriously carpeted and tastefully decorated spaces, virtually after the approved manner of the latest up-to-date exhibition theories. That was a show that was a show, sure enough! It was a success from the standpoint of sales, or popularity; and as for gate receipts, they demonstrated the money value of a show franchise so completely that it was only by a narrow margin that they failed to start a split in the ranks of the dealers, because a few and not all the members of the asso-

ciation had profited from the control of the exhibition hall.

Another show was given by the dealers' association in March, 1904, with even greater success than before. Not only did the manufacturers attend very generally and back up the local agents with special exhibits, but the general public up through New England seized the opportunity to come down and have a look at the newest cars. The Boston dealers reaped the harvest that had been slowly ripening through several years of desultory promotion by all factions of automobile interests.

So big was the 1904 show, and so closely did it crowd the limited space in Symphony Hall, that the show was no sooner over than the dealers secured the option on Mechanics Building for the corresponding time in 1905. When that time came round, their judgment was vindicated by a show which for size and importance and field of influence was ranked almost in the same class with the big shows of Chicago and New York. It was freely admitted that of the entire aggregation of shows given in this country in 1904 and 1905, if not in 1903, the Boston shows were second only to those in New York.

The estimate of those years appears likely to be fully borne out by the show now about to open.

NEW ENGLAND AUTOMOBILING

Its Growth Rapid and Good Roads Assisted in the Progress.

The growth of automobilism in New England has been rapid. Only a few years ago anyone at all interested in the subject could name from memory the owners of cars in this part of the country. There was Fiske Warren, the pioneer, whose electric brake gave Bostonians about their first glimpse of a horseless carriage; the Stanleys

with their steamers; George E. McQuesten, who was about the first to get together a "stable" of automobiles; J. Ransom Bridge, Royal R. Sheldon, George H. Morrill, Jr., and a few others, living mostly in Boston and vicinity. At the present time the records of the Massachusetts Highway Commission show that there are something like 13,000 cars registered in this state alone, while in Maine, New Hampshire, Vermont, Rhode Island and Connecticut there are thousands of other machines, and there is hardly a town or hamlet in the Berkshires, the White, or the Green mountains that is not familiar with the automobile.

This rapid growth is attributable, perhaps primarily, to the fact that there is much wealth in New England, and that the capitalists of this part of the country, though conservative to a degree, have always been noted for their Yankee sense for seeing developments a long way ahead. But there is no doubt that, admitting the power to purchase automobiles, good roads have played as important a part in the development of automobiling as any other element. New England roads are not all first class by any means, but the main arteries of travel, through long and constant use and the agitation of the bicyclists, were ready for the automobiles when they arrived, and offered the best opportunities for touring to be found in America. And the automobilists were quick to take advantage of these conditions, and tours between New York and Boston were among the first long trips that were undertaken by the early drivers.

In the trade progress has been commensurate with the adoption of the automobile as a pleasure vehicle. Nearly every Bostonian remembers when the automobile trade was confined to two or three stores on lower Boylston street, where the Locomobile steamers and those of the Mobile Company of America were sold and the old

Lewis garage on Stanhope street, the first garage in Boston. This accommodated something like a half dozen machines. Those were the days when the "Red Devils" of the Newport summer residents were the wonder and the fear of the country inhabitants, and when the arrival of one of these machines in Boston occasioned as much interest as would be shown to-day by the appearance of an airship.

Harry Fosdick was early identified with the steam car and managed one of the Boylston street stores. J. H. MacAlman was later associated with the Locomobile store, and as he is still with the Locomobile company, he is one of the veterans of the trade who have not changed their affiliations. George H. Lowe, long with the White company, is another veteran. In foreign cars Kenneth A. Skinner, president of the Boston Automobile Dealers' Association, was the pioneer, and his little De Dion runabouts were about the first foreign machines that were seen on the streets of Boston.

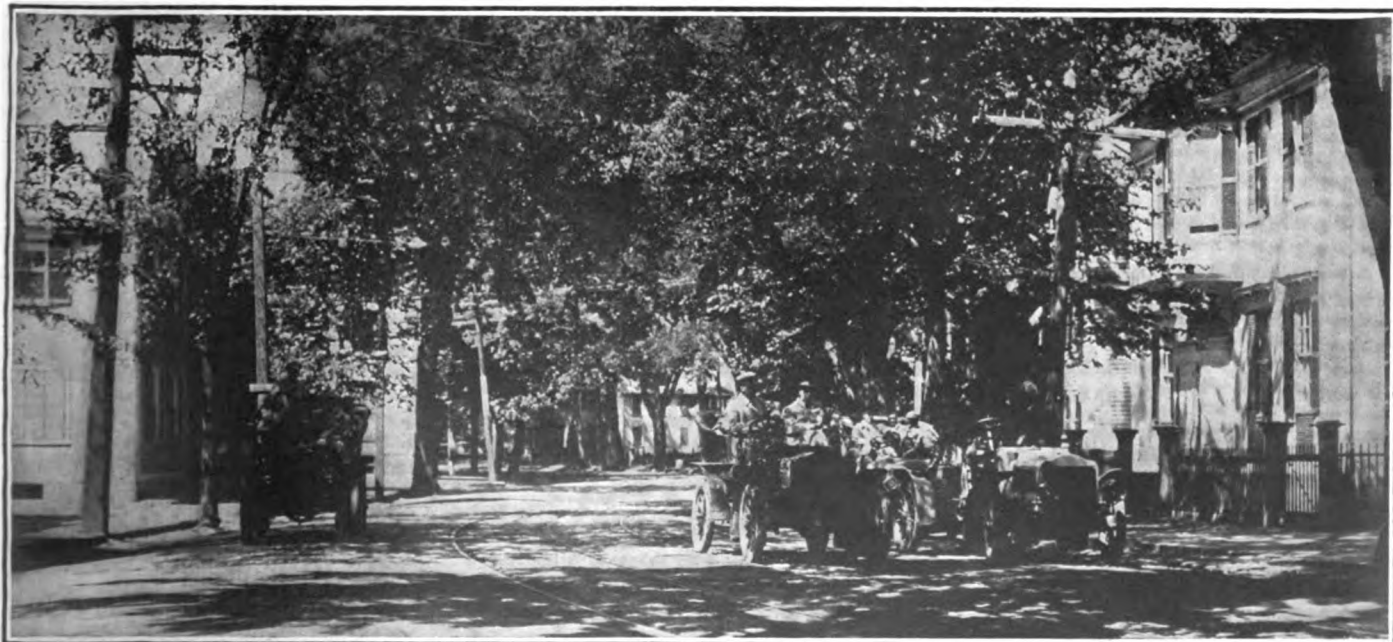
With the development of the gasoline car the trade shifted from lower Boylston street and usurped the old bicycle section on Columbus avenue. Gradually the bicycles were driven out, and Columbus avenue between Park square and Clarendon street became the home of the automobile. One of the first independent salesrooms and garages to be built was that of the Winton company on Berkeley and Stanhope streets. There was a long period in which the agencies and branches confined themselves to stores, but within the past two years there has been marked expansion, and now there are plenty of concerns which occupy entire buildings. At the same time the territory covered by the automobile trade has extended and now the district extends from the Tremont garage on the east to the White building on the west and from the Motor

Mart on the north to Massachusetts avenue on the south. Along with this expansion has gone the development of branches in the smaller cities of New England. The size of this development is indicated by the very recent Portland show.

In Boston the most recent indication of progress has been the opening of the Motor Mart in Park square, a fire-proof structure of steel and concrete occupying an entire block. Under one roof are about a score of stores, most of which are already occupied by dealers, and a three-story garage with 60,000 feet of floor space, capable of accommodating more than 300 cars, automobile elevators, turntables, chauffeurs' quarters and every modern equipment for a garage. The opening of this structure devoted exclusively to automobiles, while it has resulted in the shifting of a number of concerns, has made little impression on the district, as new concerns have come forward rapidly enough to fill up the stores as fast as they are vacated.

In the matter of legislation Massachusetts has been a leader from the very first. Up to 1902 the park rules which required numbers were considered sufficient. In 1903 the general statute for registration of cars with the State Highway Commission and the licensing of chauffeurs, together with the establishment of speed limits of fifteen miles in the country and ten miles in crowded sections, was passed and has since been the basis of the control of automobiles, although it has been amended in details each succeeding year, there being several propositions before the present Legislature looking toward changes in the law. This Massachusetts statute, together with the law of New York, has been the basis upon which have been constructed to a great degree the automobile laws of other states.

As to the future everything is conducive to an optimistic view.



LIGHTS AND SHADOWS OF OLD SALEM—A TYPICAL BAY STATE TOWN, WHERE WITCHES ONCE WERE BURNED.

TENDENCIES IN CAR DETAILS AT SALON.—IV.

By RENE M. PETARD.

(Continued from page 432, issue of February 22.)

METAL-TO-METAL CLUTCHES.

PARIS, Feb. 24.—All the drawbacks of the leather-faced cone clutch, already mentioned, have led the designers to look for different means of solving the problem. In the machinery trade, clutches of various types, based upon the friction of metal against metal, have long been used, and the success with which they have been able to perform their work induced automobile designers to try them for automobiles. Among the first clutches adopted for the purpose in France we find the Julien, which is still extensively used in French factories on machine tools and for similar purposes. In this clutch, which we class with the metal-to-metal types, simply on account of its general lines of design, leather is still resorted to to increase the friction coefficient between the driven and the driving members. It consists of an internal expanding spring steel band working inside a drum, and lined with leather on its outer face. The expansion of this band, in order to produce the friction, is obtained by means of an almost radial arm, carrying a roller at its inner end, and pivoted upon a plate which forms part of the driven member. A cone which slides longitudinally upon the central shaft causes the lever to rock on its fulcrum and push the free end of the band away from the other, which is also fulcrumed upon the driven member's plate. The drum naturally forms the driving member.

This clutch presented a number of advantages over the cone type, but the main disadvantage of the latter—the presence of leather—subsisted, so that further improvements were required, which gave rise to the clutches exhibited in a perfected state this year. For the sake of clearness we shall divide the study of this subject into several headings, according to the main characteristics of the apparatus discussed. These headings will be:

- (1) The disk clutch.
- (2) The expanding segments clutch.
- (3) The spiral or coil clutch.
- (4) The band clutch.
- (5) The expanding pads or blocks clutch.
- (6) The hydraulic clutch, which, although a metallic construction, does not rely upon metallic friction for its work, and can consequently be classed with metal clutches only by stretching a good deal the meaning of the word.

The disk clutch is now extensively used in Europe as well as in America, and certainly deserves to be. Among its present users we find Clement-Bayard, Clement-Gladiator, De Dion, Aries, Panhard, Men-

delsohn, in France; Rapid, Italia, Bianchi, and Fiat, in Italy; Hele Shaw, the originator, in England. The latter, although not exhibiting cars, had a very comprehensive show of his clutches and parts at the Salon.

The number of plates used is generally very great, from forty to sixty, and their diameter is small, the whole clutch being generally contained entirely inside the fly-wheel hub so as to permit the use of fan blades between the clutch and the flywheel rim. The mounting of the plates so as to make them alternatively driven and driving, is similar for all types, except, perhaps, in minor details, slots being cut on the inner or the outer edge of the disks, as the case requires, which slots fit keys on the driven and driving drum and arbor. These clutches are intended to work in oil.

The plates used on the clutches made by the concerns mentioned are flat when

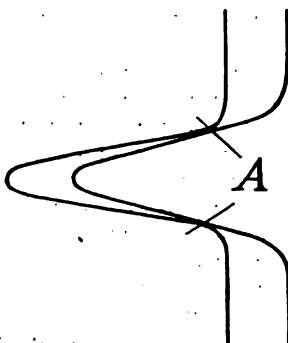


FIG. 1.—SKETCH OF CROSS SECTION OF HELE SHAW CLUTCH DISKS.

pressed in contact by the spring or springs, but they are generally made to be slightly convex and springy when free, so that upon the spring being released, the natural elasticity of the plates causes them to resume their convex shape and thus free themselves from mutual contact on their entire surface. This for two reasons: the first is to avoid the slight "dragging" which might result of a continuous contact, even if no spring pressure were applied; the second is to permit the access of oil to the frictional surfaces as soon as the plates are partly or entirely relieved of the pressure. Facing plate clutches with leather is considered by French makers to be merely a makeshift to cause a plate clutch to work as near as possible in the way it should have worked without leather, if it had been so designed.

In the Hele Shaw type, as made by the inventor himself, the plates are not flat, but on the contrary carry deep concentric corrugations which under the pressure of the spring enter each other, but by their

very shape are stopped from coming into contact on their entire surface, the points of contact forming two circular lines, as shown at A in Fig. 1. The idea is to obtain (together with a sort of wedge action which gives a more powerful driving contact) a large oil capacity outside of the line of contact which, by reason of the great pressure it has to stand per unit of surface, runs dry when the clutch is driving positively, and becomes lubricated as soon as slip is permitted by the releasing of the pressure. The Fiat intends to use this type of plate, according to public rumor, while the Scotch house of Argyle has ordered from Prof. Hele Shaw enough clutches for the entire 1906 output. This is said to be the largest order ever placed for a special type of clutch, the contract calling for more than a thousand. The De Dion clutch, which also belongs to this class but only possesses three plates, or rather two plates and a faced part of the flywheel, has been described fully in another previous report, and consequently does not require more than a passing mention here. It might be noted, however, that it presents a great similarity in principle to that employed in the American Austin car.

Expanding segment clutches practically amount to mechanisms similar to those used for the modern expanding internal brakes. These clutches can be found on the Rochet-Schneider, Martini, La Buire, Desgouttes, Pilain, Motobloc, Gillet-Forest. They only vary by the means used to produce the expansion of the segment, the end aimed at being in all cases to transform the axial pressure of the spring into an expanding circumferential pressure. This is generally done by using a wedged- or a coned-shaped sliding member, acting upon suitable levers or toggles. In some cases, however, the action is by means of quick pitch screws, all the clutches of this latter type being indebted for their principle to the Bonnafoux clutch, which was a pioneer together with the before-mentioned Julien. In this clutch the ends of the expanding segment (Fig. 2) carry short links connected to a right-and-left-hand thread screw placed parallel to a diameter of the driving drum's circle. A small arm perpendicular to this screw and fulcrumed in the same bearing extends toward the center of the clutch and close to the centered shaft by a ball forming part of a ball-and-socket joint connected to the clutch's sliding member. When the spring pushes this sliding member forward the arm's end follows and turns a screw a fraction of a revolution; this, together with the linkage, produces

the expansion of the clutch. In some of the modern applications of this clutch to automobiles two screws and arms and two half segments are used. This is the case with Pilain and Gillet-Forest. These clutches also work in oil, but they have the great drawback of not permitting very well a symmetrical construction. This leads to lack of balance and consequent vibration, unless extra weight is added to make up for it in the form of counterweights.

The spiral or coil clutch is based upon the well-known Lindsay principle, and, although it is not very extensively used in European automobile constructions, the repute of the makers who use it, namely, Mercedes and Pipe, make it a noteworthy system. No proper study can be made of it other than a mere description of the production of the two named makers, but this is too well known to be within our subject.

The band clutch was only represented by one type at the Salon. It is used by Mors, being a new departure for that concern, which previously used the cone and leather, and will use the band for all the 1906 productions, this system having given the highest satisfaction on their 1905 racing car. Users of the former gear-driven model of the Orient buckboard will find in the high-speed clutch of their machine an illustration of the principle of the Mors clutch, if they only can forget that there is leather on it.

In the Mors clutch (Fig. 3) the action is as follows: A flat steel plate *P* in the form of a beam carries one end of each of the two half steel bands *B* which surround the flywheel drum *D*. This plate is centered in the flywheel and forms the driven member of the clutch. It also carries the fulcrums *f* of two levers *L*, the shape of which is exaggerated greatly in irregularity in the diagram, which carry at their outer ends the free ends of the steel bands. A cone *C* slides on the clutch shaft under the pressure of the clutch spring, and by its action

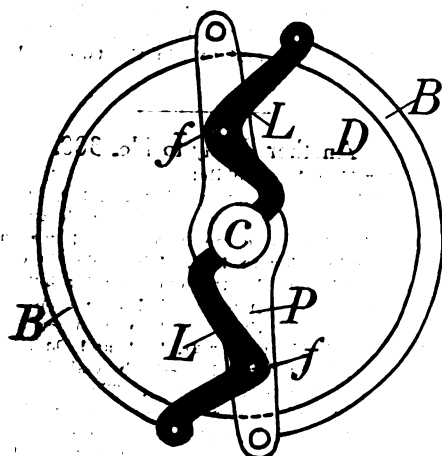


FIG. 3.—DRAWING SHOWING MECHANISM OF MORS CLUTCH.

expands the levers which by rocking tighten the bands around the drum, suitable screws being fitted for adjustment. The bands on this clutch are lined with cast pads

about two inches long each and separated by a space about two millimeters wide; this is in order to leave them all their flexibility, as they are made out of bands of spring steel.

By "the expanding pads or block clutch" it is intended to mean the clutch which is

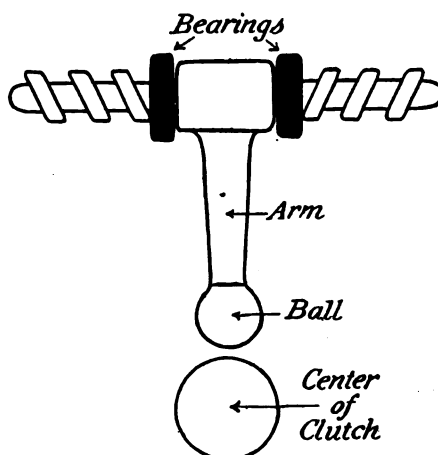


FIG. 2.—SKETCH SHOWING PRINCIPLE OF BONNAFOUS TYPE OF CLUTCH.

fitted on the Gobron-Brillie machines. The term is rather vague, but it is as near to a comprehensive term as the writer can think. The clutch in question is the Herisson clutch, which was described in detail a few months ago in these columns. It will be remembered that the degree of slip permitted before the load is positively taken up can be mathematically determined by the maker, while this clutch which contains no clutch spring proper adjusts itself to any power it might be required to transmit up to the breaking point of its constitutive parts.

As a description of this mechanism would further increase the length of this already too long study we shall refer the reader to the very full account which was previously given of this Herisson clutch.

Before closing with the hydraulic clutch the Hautier clutch might be recalled. This clutch is at the same time a planetary speed reducing gear. It acts by the tightening of a band around the outer member of a planetary set otherwise idle, thus giving a free position and a driving position with a reduction of 3 to 1.

The hydraulic clutch is one in which the driving agent is the friction of a liquid. The principle of the attempts made in that direction ("attempt" is the word used, as no really practical device has yet been worked out), is that of a rotary pump the delivery pipe of which would be stopped, thus causing the rotating part of the pump and its casing to run together, this being the driving position. If the delivery pipe be opened and in communication with the intake there will be no tendency for the parts to rotate simultaneously, this being the free position. Any intermediate or throttled condition of the by-pass would give any desired amount of driving or slipping. The principle is approximately the same as that of the

well-known Lemp steering check which had such a success in the States.

The main defect of these clutches is the practical impossibility of getting down to a practical solution of the absolutely correct principle. This on account of the numerous points required, each of which leaks inevitably under the huge pressure set up by the drive in such an apparatus.

Attempts in this direction were shown by Turgan, Martin and Sparks & Boothby. None of these cared to disclose the general construction of their apparatus, neither would they show one working. It should be noted that Martin's seems to be the best from outside appearance, as it possesses only one exterior joint instead of three to nine in the other apparatuses. These are only mentioned for the sake of completeness, as although no satisfactory results have yet been secured there is undoubtedly a large field and a promising one for the inventor with pluck and money.

(To be concluded.)

FLORAL PARADE IN MOBILE.

MOBILE, ALA., March 3.—An automobile flower parade was held here last Tuesday and there were a number of very prettily decorated cars in the line that twice circled Bienville Square, passing the reviewing stand where the queen of the carnival and her maids reviewed the procession. Although the eight machines in line were disappointing in the single matter of numbers, each made a splendid appearance, the most attractive being the new Austin car of William Clark, handled by John Schaurmann. It was tastily decorated with *fleur de lis* and the carnival colors, and carried five pretty young ladies—the Misses Schaurmann, Geary, Roberts and Burns.

First prize of \$100 was awarded, however, to Mrs. William F. Tebbetts, who drove her own car, decorated with tiger lilies, and accompanied by three young ladies. Mrs. Charles Hervey won second prize of \$50 with an electric car decorated with American Beauty roses, and third prize of \$40 was awarded to Mrs. James O'Grady, who drove a red gasoline car decorated with red poppies.

NEW AUTO STAGE LINES.

Dr. A. James DeNike and Charles Brooks, of Whitehall, Mich., will start an automobile line between that city and Muskegon, Mich., this summer, making three trips each way per day. They will have an automobile 'bus which will carry ten persons and will run on a schedule. An auto line from Whitehall to Sylvan Beach summer resort is also under consideration.

An automobile service is shortly to be put on between the main post-office in Detroit, Mich., and the new sub-station nearing completion at Lyman court and Russell street. Detroit is the first post-office in the United States to be authorized by the department to use automobiles regularly between sub-stations.

Letter Box

Reply to Inquiry No. 319.

Editor The Automobile:

[320.]—"Amateur," who asks in the February 22 issue of "The Automobile" why his motor slows down or stops when the throttle is opened after the engine has been running slow, will probably find that the spring on the automatic air valve is too weak. When the throttle is opened suddenly the vacuum in the carburetor opens the air valve too much, admitting an excessive quantity of air which results in a non-explosive mixture being taken into the cylinder.

Why the motor works satisfactorily after it or the car gets under way, can be understood by bearing in mind that at high piston speed the vacuum in the carburetor will be sufficiently powerful to draw the proper amount of gasoline for an explosive mixture, notwithstanding the fact that the supplementary air valve may be wide open.

The remedy for the trouble mentioned is a heavier spring on the automatic valve. Care must be taken, however, not to fit a spring that is too stiff, as this would result in causing other troubles, the chief of which would probably be difficulty of running the motor at low speed because of too much gasoline being aspirated.

The question of automatic air valve adjustment for smooth running at different speeds cannot be considered without taking into account the size of the air passages through the carburetor and the area or bore of the atomizing nozzle. The carburetor problem is a very complicated one—more complicated than many automobilists imagine—and is sometimes a riddle even to experts.

Non-Freezing Solution Experiments.

Editor The Automobile:

[321.]—In reference to your suggestion asking for experiences with non-freezing solutions for water-cooled cars, would say that I have been experimenting for the past two winters with different things, and, despite the assertions of our air-cooled friends, it is, in my experience, a good deal more trouble to get a gasoline car warm on a cold morning than to keep it cool afterward.

I have tried wood alcohol and water, equal parts; wood alcohol, glycerine, and water; and glycerine and water alone, in various proportions; all work well, but the odor is offensive, and it is not always wise to look into the tank or radiator with a lighted match. These mixtures, are however, quite satisfactory for cars having tubular radiators, with no fan, especially if there is zinc, galvanized iron, or aluminum in any part of the cooling system, as these metals are easily corroded by solutions of various salts.

For large engines, especially in cars where the radiating surface is none too large for the power, there are few things which will give better results than strong solutions of pure calcium chloride. It must be changed three or four times in a season, and is not pleasant and cleanly to handle, but is very effective. The writer used it all last winter in a 12-horsepower and a 45-horsepower.

There is one trouble with all mixtures and solutions: there is no certainty as to their strength after a brief use; even a hydrometer will not give reliable tests on account of chemical changes, particles of iron rust, etc., held in suspension.

Water cooling really gives so little trouble that the parts belonging to the system are apt to be shamefully neglected. Keep the pipes, radiator, pump, etc., clear and in good order and entirely free from leaks, and have the pump working and the fan in order.

There is one other plan which I have tried this winter on a 20-horsepower, four-cylinder car, and it has worked even better than water usually does. Unfortunately, it is not suited to large motors, and will not usually work in tubular radiators, even for small ones. The car in question has been in constant service; in fact, has been out every single day since it was bought, last September. The first of November I filled the cooling system with ammonia oil so called. This is a thin oil, used principally for lubrication of ammonia ice machines, and remains perfectly fluid at 10 degrees, and probably much lower. Since that time the machine has run 2,235 miles, the temperature has ranged from 78 degrees in the shade to 4 degrees, and the oil has not been renewed and none has been added. The oil is, of course, not corrosive, nor is there the slightest odor from it.

If you have a machine with a good vigorous circulation, cylinders about four inches or less, and a cellular or other finely divided cooler, the oil will probably fill the bill. Good grades of this oil cost about thirty cents a gallon, and do not flash below 375 to 400 degrees, so that it should probably be as safe as alcohol solutions, and the cost per season is practically negligible.

Fraola.

Providence.

Motor Horsepower Ratings.

Editor The Automobile:

[322.]—What is meant in referring to the rating of gasoline motors, by such terms as "18-20," "28-30," "45-50" and so on as applied to horsepower? Which number represents the actual horsepower the motor is capable of developing, and what does the other number mean? XX.

The first number indicates the horsepower the motor is supposed to develop at its normal speed, and which it should sustain. The second number indicates the maximum horsepower available by speeding the motor beyond the normal number of revolutions per minute—in other words, the power that can be used for emergencies where an extra power is required for a short time.

That Climb That Did Not Come Off.

Editor The Automobile:

[323.]—We notice in your March 1 edition a reference to a Cleveland hill climbing contest which did not come off.

As your article is not clear, we would like to give the facts of this case. We append the contract which Mr. Paxson made out and which he insisted we sign or nothing at all. You will notice by this contract that there would be no possible chance for us to win, as a contract of this kind must state specifically if either party is to receive any money. Mr. Paxson agreed to race his car up any hill which we might select, and, as we left it open to their suggestion, they suggested Cornell street hill, as they thought our car was geared for steep hill climbing and that we would not be able to make sufficient speed on the low grade at the bottom and also at the top of the hill.

We offered to race the Jackson car up any hill which they might select without any contract, the only conditions being that both start at the bottom at the same time and the one which was to reach the top first was

to receive the money. We put up \$200 in cash with the sporting editor of the Cleveland "Leader," William McKay, and the Paxson Motor Car Co. put up a check for \$200 which the "Leader" refused to accept, as he had written across the top of the check, "This is subject to a written contract." The Paxson Company made a play to get the check cashed, but did not do it, and afterwards suggested that we race for fun. Of course, we would not do this, as our car is not in the same class as theirs, and the only thing which we could get out of it would be the money. There would be no credit to us in racing a car of their class. We were unable to get the Paxson Company to sign any kind of a contract at all or to put up any money to race on any hill.

We are inclosing you the proposition which we made to the Paxson Motor Car Co., and we were and are still willing to substitute in this contract any hill which they may suggest.

These two contracts which we are inclosing you are exact duplicates of the ones which were made out.

We hope that you will publish this so that the public may not be misinformed as to the true state of affairs.

R. H. Magoon Motor Car Co.

Cleveland.

Herewith are the two proposals:

Paxson Motor Car Co. proposal:

"Article of agreement of hill-climbing contest and speed test between standard stock gasoline Pope-Toledo and Jackson cars:

"The speed test on level is for car crossing the line first, said cars are to be standard stock touring cars used in the hill-climbing contest without any alterations.

"Hill-climbing contest is not for car getting up first, but the car to win is the car making hill with same number of people in on high gear without any shifting of gears.

"Be it fully understood between the Paxson Motor Co. and the Magoon Motor Co. that the Pope-Toledo is to win both contests or Magoon loses the wager (\$200)."

Magoon Motor Car Co. proposal:

"We wish to make the following proposition to the Paxson Motor Car Company:

"We have put up with Mr. McKay, of the Cleveland "Leader," two hundred dollars in cash. We will start our Pope-Toledo car, on high gear, at Euclid avenue, corner of Cornell street; they to start their Jackson car at the same time and place, and put up two hundred dollars in cash. The car which first crosses the line at Cedar avenue car track, beyond the top of the hill, is to win the contest and to win the two hundred dollars."

Another Reply to No. 300.

Editor The Automobile:

[324.]—Letter Box Inquiry No. 300, in reply I beg to state that the two-cycle engine was the first to come into general use and was made prior to 1892. The point in controversy is not the two-cycle engine but the three-port system as applied to a two-cycle engine, on which there are two patents—Sintz, No. 509,255, November 21, 1893, and Day, No. 544,210, August 6, 1895—both claiming to cover the three-port system. These patents do not cover the two-port system or where the air is taken into the crank case through a check valve. Barthel & Barthel.

Detroit.

The patent claims and principle patent office drawings as contained in the Sintz and Day letters patent given above were published in "The Automobile" for February 22, 1906, page 419.—Ed.

Ottawa, Canada, an Interesting Touring Center.

By ROBERT BRUCE.

DURING the summer of 1905 the writer had occasion to make a few short trips in and about Ottawa, Canada, and was not a little surprised by the motoring possibilities in the neighborhood of the Dominion capital. Another source of surprise was the number of cars owned there and the interest exhibited by the pioneers of automobiling in that district. The tourist making a few excursions in and about Montreal and Toronto may possibly imagine that the upper limits of Canadian touring have been reached. Not so; Ottawa and Quebec, at least, are worth considering in the same connection.

Ottawa is interesting in many ways to the stranger. The city is superbly situated on a high bluff at the confluence of the Ottawa, the Rideau and Gatineau rivers, the former the interprovincial boundary; it possesses the distinction of being the political headquarters of the Dominion, where the Parliament assembles and where the Governor General and all the ministers reside; it has the air of progressiveness and a resolute activity is noticed on every hand. One's first five minutes' ride along the main thoroughfare—Sparks street—say from the Canada Atlantic Railroad station or the nearby post-office to Bank street, where the principal automobile agencies are located—will convince him of the substantial character of almost everything in Ottawa.

Ottawa has a population in the neighborhood of 70,000, and nearly 100 miles of streets are within its limits. The half dozen wideawake American sawmill men who located there during the forties and fifties were attracted by the magnificent force of the Chaudiere Falls, estimated at about a quarter-million horsepower, and the vast Canadian forests, drained by the Ottawa and its tributaries.

One of the most beautiful driveways in all America is that extending from the government property on the northeastern city limits, southerly and in part along the Rideau Canal banks, and then westerly to the Experimental Farm. The farm is one of the projects of the Ottawa Government Commission, a body of five men clothed with unique powers. Since the government pays no taxes of any kind to the city where its vast properties are located, an appropriation of \$75,000 a year is contributed toward the beautifying of Ottawa. This commission has the power to take over any property needed for its purposes, to close any existing road or build any new thoroughfare it sees fit. The money donated by the government is spent to good advantage, and still better results are expected from future appropriations. Besides the driveway to the farm, Rockliffe Park has been much improved out of the same fund.

Ottawa is in reality the center of a superb but as yet largely unexplored touring dis-

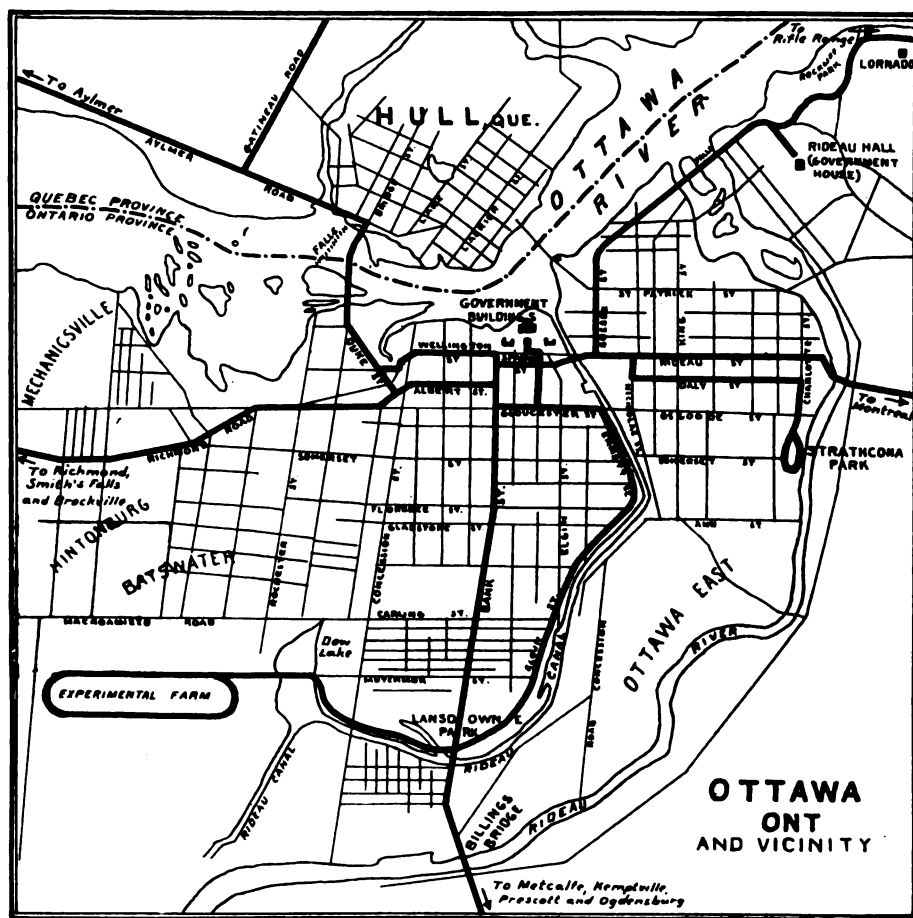
trict, with fair roads leading to many interesting places. It is possible to tour all the way to Montreal, about 130 road miles distant, or to reach the St. Lawrence River at either Prescott (opposite Ogdensburg, N. Y.), Brockville or Kingston, the route to Kingston being part of the way along the famous Rideau chain of lakes. Then there are a number of splendid short rides to nearby places of interest on both sides of the interprovincial line. Within the next few years some of these routes ought to become about as well known as corresponding routes on the American side.

Hull, opposite Ottawa, and the third city in size in the Province of Quebec, is most

direction. The Parliament buildings should be considered the center of all local trips. The route to the Experimental Farm, along the Rideau Canal, comprises the principal portion of the new Government driveway, and should be traversed by every automobilist. Strathcona Park, near the Rideau River, has been opened recently by the Government Improvement Commission, and is well worth a visit. Rideau Hall, the residence of the Governor General, Rockliffe Park, and Lornado, the extensive estate of Warren Y. Soper, are reached by the line shown from the center of the city across the Rideau and up along the banks of the Ottawa River.

OGDENSBURG TO OTTAWA.

The principal gateway into the Ottawa district from New York state is Ogdensburg, from which the Canadian capital is



MAP OF OTTAWA, ONTARIO, SHOWING THROUGH TOURING ROUTES AND ROADS TO PRINCIPAL PLACES OF INTEREST.

widely known as the headquarters of the greatest lumber industries in the world. Here the enormous water power of the Ottawa River is seen at its best. One can drive his car from Ottawa to Hull through the lower part of the town, and back on the opposite side of the river, easily in half an hour, part of the journey being in Ontario and part in Quebec.

The accompanying map shows all the principal routes into and out of Ottawa, which even the locally unacquainted tourist will have no difficulty in following in any

distant a trifle over sixty miles. The ferry across the St. Lawrence River from Ogdensburg to Prescott, on the Canadian shore opposite, is amply large for any automobile. There are two towns between Prescott and Ottawa for the tourist to keep chiefly in mind—the first is Spencerville, eleven miles from the starting point; the second, Kemptville, distant about forty miles from Ottawa. The road for the entire distance is fairly good; and unless there have been heavy rains one can very comfortably average fifteen miles an hour.

Fifteen miles or so before reaching Ottawa there is what is called the "Military Highway," which is macadamized, and over which you can make any speed desired within the limits of your machine. From a point about ten miles below Kemptville to the "Military Highway" the road is sandy, but not to a degree to cause unpleasant driving. Four hours will ordinarily be sufficient to cover the entire distance, and for the last forty miles (from Kemptville to the outskirts of Ottawa) a speed of about twenty miles an hour can ordinarily be maintained.

From Kemptville the route runs via West Osgoode to Dawson; thence to Greeley's and from Greeley's to Ottawa. This run finishes at Ottawa over Billing's Bridge, spanning the Rideau River, and comes directly into Bank street, on the downtown end of which the principal garages will be found. A right turn from Bank street to Sparks street will place the tourist on the principal business thoroughfare of the city.

OTTAWA TO BROCKVILLE.

Many tourists, in arranging runs from St. Lawrence River points to Ottawa and return, go via Ogdensburg and return via Brockville, between which and Morristown, on the American side, there is a good-sized ferry, crossing the river at frequent intervals. This gives a "circular trip" of something more than 120 miles, and as Morristown is only ten miles from Ogdensburg, both on the St. Lawrence, there is not much lacking of a complete circle. The route from Ottawa to Brockville is as follows:

Leave Ottawa via Albert street and Richmond Road, over gravel road to Bell's Corners, and via Bell's Corners and Fallowfield to Richmond; thence by clay road from Richmond to Franktown via Dwyer's Hill. From Franktown to Smith's Falls there are two roads. New telegraph poles are planted on a portion of the way on the new road, which leads to the left after leaving Franktown village, and before crossing the railway tracks. This road is better than the old road, with which it connects about three miles above Smith's Falls. Pass out of Smith's Falls by Beckwith street, cross the bridge, thence by gravel road through New Bliss, and Toledo to Frankville, Addison and Glen Buell to Tincap and Brockville.

As highways go on this continent both of these roads are fairly good in dry weather. Reckoning in both cases from Ottawa, the road to Prescott is macadamized to Metcalfe, a distance of twenty miles and the road to Brockville is macadamized to Richmond, a distance of twenty miles. Beyond these points the road alternates between gravel and clay. Distances: Ottawa to Prescott (Ogdensburg), sixty to sixty-five miles; Ottawa to Brockville also sixty to sixty-five miles, according to the way the trip is made.

Taking an Automobile Abroad.

By W. P. STPHENS.

MANY owners who contemplate an automobile trip abroad, using their own car, are puzzled to know how the transportation of the machine on a steamer will be accomplished. The shipment is really by no means as difficult an undertaking as it at first sight appears, and so many automobilists have made the transatlantic trip, by so many different lines, that the steamship companies have become accustomed to handling this rather bulky baggage. An investigation of the subject has been made for the information especially of intending tourists, and the procedure here discussed, while applying more particularly to the port of New York, is not very different from that followed in Boston, Philadelphia and other ports.

The first point is to make sure of such compliance with the customs regulations as will avoid all trouble and dispute, either in the port of arrival or on the return of the machine to the United States. There is, of course, no duty on a machine built in the United States when returned from a foreign port, but at the same time it is desirable to

take out a shipping manifest. This may be obtained by a personal visit to the Custom House, without the services of a Custom House broker. It is well to bear in mind, however, that it is in general best to transact all Customs business at home and abroad through a broker, as the fee is small in comparison with the annoyance and loss of time to which the owner may be subjected in attempting to conduct the business himself under conditions with which he is unfamiliar. No government charge is made for the shipping manifest, and no charge whatever on the return of the car.

In the case of a machine of foreign make (which has already paid duty on its original entry) the routine is a little more complicated; no duty is levied upon the return of the car, but to make sure of the free entry a certificate of registration is necessary. This may also be obtained personally at the Custom House, but, in addition, it is necessary in New York to submit the car for inspection at the Appraisers' Stores, at Laight and Washington streets. Here an inventory is made of the condition of the car

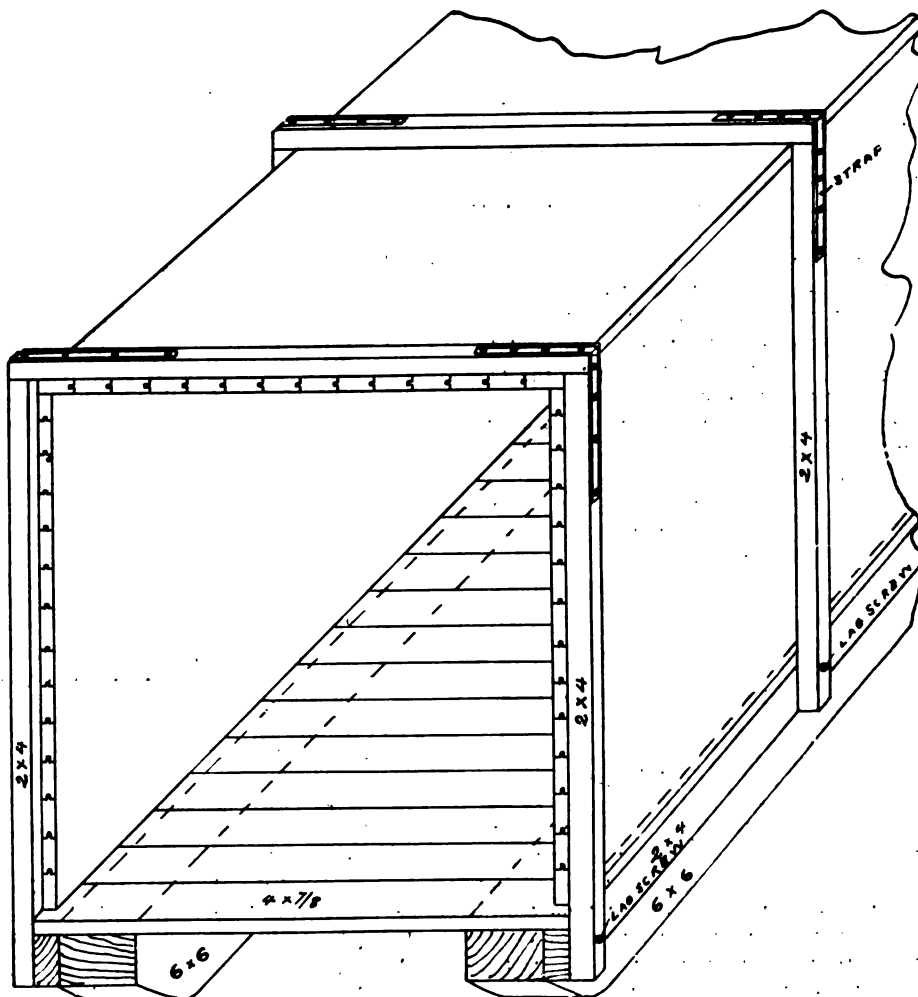


DIAGRAM OF CRATE FOR SHIPPING AN AUTOMOBILE TO EUROPE, SHOWING ARRANGEMENT AND DIMENSIONS OF SCANTLINGS.

As the date of the European circuit clashes with Brescia week, the Italian A. C. will not be represented in this touring contest.

and the tools, parts and tires, in order to prevent the shipment of the car abroad for radical repairs or rebuilding and the bringing in of a new outfit of tools and parts.

For shipment by steamer the car must be securely crated or boxed, either being optional with the shipper, provided that the car is adequately protected in hoisting and stowing. In the case under consideration, of a touring car under private ownership, the car will be boxed as nearly as possible in running condition. Cars of ordinary dimensions are usually stowed in the hatchways, where they may be lifted out immediately on arrival. With the big cars, such as buses and the largest touring machines, it is sometimes necessary to lower the box or crate end first, the length being too great for the hatch.

The boxing may be done where most convenient, the car being sent by rail to the port of shipment and carried by truck to the steamer, but where it is possible, the easiest way is to drive the car under its own power to the vicinity of the wharf, empty all tanks, stow all parts securely and turn it over to the men who make a business of boxing goods for shipment. If desired, the whole business may be placed in the hands of one of the large foreign express companies, which will attend to the customs, boxing and freight charges. The charge for a crate or box in New York is from \$50 to \$60, and the ocean travel is based upon the number of cubic feet in the package. In most cases the box will be required for the return trip, and it should be built with a view to easy removal and replacement without damage, all parts being put together with carriage bolts, lag screws or large wood screws. Only seasoned lumber should be used, and the holes for the main bolts should be larger than the bolts. After the car is removed on arrival on the other side, the case will be stored in some private warehouse near the wharves, or by the steamship company, until needed for the return trip. If built of unseasoned lumber and left in a shed for several months in summer, some difficulty may be met in bringing the parts together and entering the bolts in their holes.

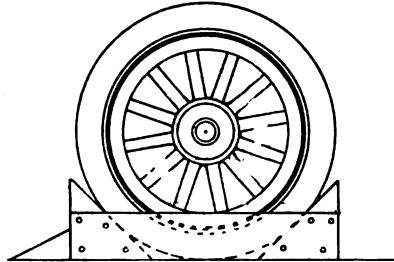
The following method is followed in one of the largest American factories in the package of cars for foreign shipment, and as the construction is both simple and strong, it is well adapted to the case of a single private car.

Cars to be shipped across the ocean are first very carefully gone over and all bright and unpainted parts are covered with a thick grease to prevent rusting. The car is then measured to determine the smallest possible dimensions of the case; the inside depth should be about 2 inches greater than the height of the car, so that the top will not strike the case through any jarring in transit.

The material for the case is the ordinary Norway pine, the sides being of 4 by 7-8 inch matched ceiling, dressed both sides. Two pieces 6 by 6 inches and 2 inches longer

than the extreme length of the car form the sills; the four ends being beveled on the under side to form skids under which rollers may be placed. The skids should be spaced at such a distance as to come directly under the wheels; on the outside of each a piece 2 by 4 inches should be spiked fast, with top level with top of skid.

The flooring should be of the same length as the extreme width of the car, and nailed permanently to the skids and the 2 by 4 inch strips, forming the bottom; care being taken to have the skids parallel and the flooring



METHOD OF CHOCKING WHEELS.

square to them. From a stick of 4 by 8-inch timber eight wedges are now cut; the car is run into position on the platform, and each wheel is blocked by two wedges well fastened to the floor and skid. A strip of heavy duck, or other material, which will not scratch the paint, is now placed over the felloe and tire and its two ends are well fastened to the floor. The fastening of the four wheels in this way prevents the car from jumping up, and should be carefully attended to. Two pieces of board from 4 to 6 inches wide are now fastened to the wedges, on each side of the wheel. Four smaller wedges are cut from 2 by 4-inch stuff and so fastened to the floor as to butt against the two forward wedges of the front wheels and the two rear wedges of the rear wheels. As a further precaution, after the axle is wrapped with some fabric to protect the paint, an iron strap is placed over the axle with both ends fastened to the floor by lag-screws.

The sides are built up on four uprights to each side, of 2 by 4-inch stuff, the length of each being the height of the car, plus 2 inches clearance already mentioned, plus twice the thickness of the ceiling, plus 4 inches. This allows each upright to lap down 4 inches on the side of the skid, to which it is fastened by a lag-screw. The stuff for the sides should be cut shorter by twice the thickness of the ceiling than the length of the skid, thus permitting the ends to set into the rabbet formed by the sides, top and end uprights. The ceiling for the sides should be well nailed to each of the four uprights. The top ceiling is similarly nailed to four crosspieces, each 2 by 4 inches. The ends are nailed up on three pieces of 2 by 4 inches, which lap over at top and bottom and are screwed to the skids and the top crosspiece. The edges of the cover should be fastened to the sides with wood screws and the crosspieces

should be fastened to the side uprights by lag-screws, after which the angle should be further strengthened by a steel band, lapping at least a foot on each piece, and fastened with wood screws. The ends may now be slipped into place and fastened with wood screws and lag-screws through the crosspieces into skids at the bottom and the crosspiece at the top. This construction leaves the inside of the box entirely free of braces and perfectly smooth. The ends, top and sides may be quickly removed in unpacking the car. The address of the consignee should be plainly marked and in another place the address of the consignor. The gross and net weight should, if possible, be marked, and also the cubic feet of space which the box will occupy.

IMPORTS AND EXPORTS OF AUTOS.

During the month of January last the United States imported 120 automobiles, of a total valuation of \$402,976, and automobile parts aggregating \$68,748 in value. These figures bring the totals for seven months ending with January to 616 cars imported at a valuation of \$2,269,378, and parts to the value of \$204,805.

Against these figures there were exports of automobiles and parts to foreign countries valued at \$297,694 in January and \$1,438,600 for the seven months ending with January. In the same month a year ago the exports were \$100,000 less.

The following table shows the distribution of our exports:

Exported to:	Seven Mos., ending with	
	Jan., 1906.	Jan., 1905.
United Kingdom.....	114,991	421,982
France	16,369	113,696
Germany	4,806	30,824
Italy	20,006	62,094
Other Europe.....	4,448	66,597
British North America..	22,107	250,116
Mexico	30,935	145,179
West Indies and Bermuda..	40,461	104,898
South America.....	3,588	41,490
British East Indies.....	4,147	24,149
British Australasia.....	32,669	117,865
Other Asia and Oceania..	2,000	29,746
Africa	1,168	20,180
Other countries.....		10,289
Total	297,694	1,438,600

An automobile weighbridge, devised by a well-known English firm, W. & T. Avery, may be laid down on any level stretch of ground without excavating, the platform being self-contained and the entire scales assembled in such a way that it may be taken down and reassembled by an ordinary workman. The capacity is 5,000 pounds, with a platform 6 by 12 feet, ample for the accommodation of the largest racing cars.

The British Motor Boat Club will have racing fixtures for the coming season at Oulton Broad on June 5, Liverpool on June 8 and 9, Cowes during the August week, and at Burnham in September. A date is also proposed for July.

Maine Successfully Has Its First Show.

PORTLAND, ME., March 3.—The first annual automobile and power-boat show ever held in the state of Maine opened in the Portland Auditorium, Monday morning, February 26, and continued successfully during the week. Assured of success from the start, the building was crowded with exhibitors, and the attention of automobilists from all parts of Maine was centered upon it. The promoter was Frederick M. Prescott, of Boston. So successful was the show that he has already engaged the Auditorium for 1907, and will make the event an annual one.

The Auditorium was elaborately decorated with American flags and streamers of many-colored bunting. The spaces were

commercial trucks were shown. One was a three-ton Oldsmobile, exhibited by the Maine Motor Carriage Company, and the other a lighter car of the Crown make.

Portland had never seen an automobile with a limousine body, so the White steamer—the only limousine at the show—caused much favorable comment.

The chassis of three cars, the first ever shown in the state, were interesting studies, particularly to the uninitiated. These were the American Mercedes, the Winton, and the Studebaker.

The display of power boats was a particularly fine one. The handsomest pleasure boat possibly was a twenty-foot craft shown by the Bath Auto & Gas Engine

rest of the week. The show proved not only interesting but educational, for it opened the eyes of many of the Maine people to the real possibilities of the automobile.

Maine is automobile enthused as it never has been before. Last year was the most successful in the history of this industry in the state, but the coming summer will indicate great growth. Agencies are numerous throughout the state, until now there is no city or town of any size that is without one. It is conservatively estimated that fully 1,500 automobiles will be owned in Maine before the end of 1906.

WANTS THE OPEN AIR SHOW.

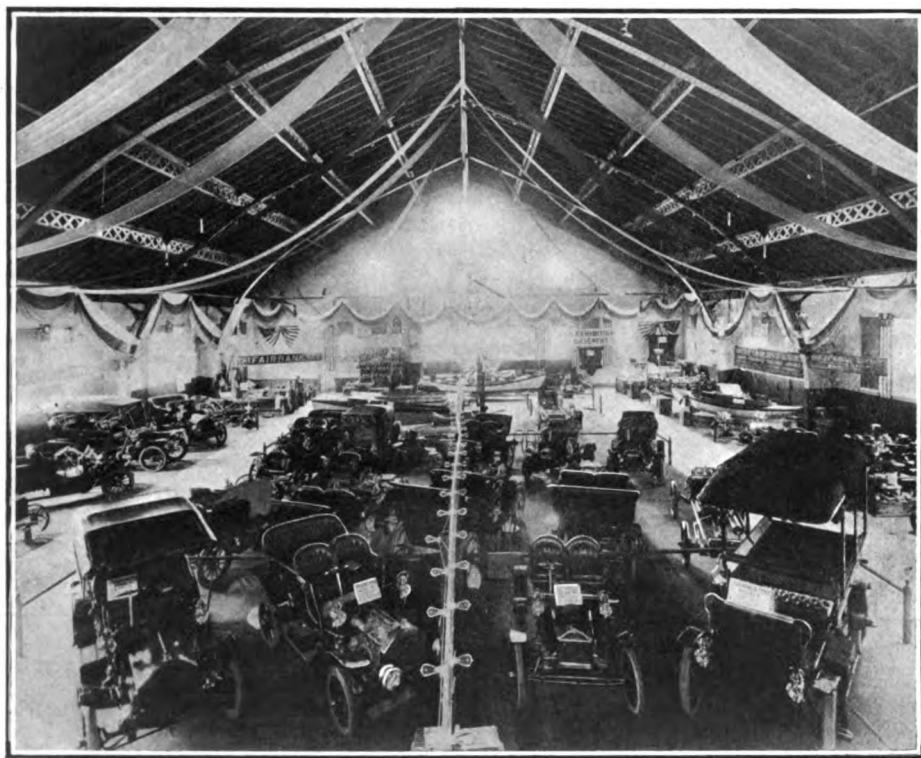
Buffalo City Legislators Much Interested and Invite the A. M. C. M. A.

BUFFALO, March 5.—It would not be surprising if Buffalo secures the first outdoor show of the American Motor Car Manufacturers' Association. This city is looking for the show, and will undoubtedly take the proper steps towards securing it. Not only are automobile manufacturers and dealers of Buffalo anxious to have the show come to Buffalo, but the city legislators have taken the initiative towards securing the exhibition. Recently the common council of this city adopted a resolution in which an invitation was extended to the association to hold its first outdoor exhibition in Buffalo.

Upon receiving the resolution of the council, City Clerk Sweeney immediately wrote to General Manager Roger B. McMullen, of Detroit, acquainting him with the facts and soliciting correspondence relative to what chance Buffalo had for getting the show. A similar letter was sent to Chairman James Couzens, of Detroit. Answers from both gentlemen have been received. Mr. McMullen's communication stated that he will spend Wednesday, Thursday, and Friday of this week in Buffalo. He also expects that the show committee, consisting of Benjamin Briscoe, James Couzens, A. C. Newby and J. B. Bartholomew, will be in this city on the same days. Mr. McMullen's letter closes with: "We shall be pleased to meet the men of Buffalo who are interested in this matter and confer with them."

Mr. Couzens' letter says: "I thank you for your courtesy in this matter, and I can assure you, in behalf of our association, that this action is highly appreciated and will, of course, have considerable bearing in making our decision as to the ultimate point at which to hold this show."

The bill for the proposed automobile road from London to Brighton, England, has been withdrawn from parliamentary debate. The question of a deposit caused the first trouble, while several protests have been raised against the laying of such a way in its proposed form.



INTERIOR OF PORTLAND AUDITORIUM DURING AUTOMOBILE SHOW, FEB. 26 TO MAR. 3.

set off by rails and electric lights, at the back of each a large sign telling the name of the exhibitor and the firm represented. On the main floor of the building were automobiles, power boats, motors, and accessories. In the basement were exhibitors who could not be accommodated on the main floor, and also a large number of second-hand automobiles. Large crowds attended all the week. In the evening concerts by the First Regiment band added to the enjoyment.

Though many of the Portland automobilists and other residents have been to some of the shows in Boston and New York, this first annual event proved a novelty and a treat to them. The pleasure and commercial automobiles displayed were objects of absorbing interest. But two com-

pany. It was fitted with a 5-horsepower Buffalo engine. Another noticeable boat was a 22 1-2-foot fisherman's dory with a 4-horsepower Tuttle engine.

The Atlantic Company had the largest exhibit of power boats. The principal one was a speed launch fitted with a three-cylinder engine of 12 horsepower, capable of sixteen miles an hour. Sea-going dories fitted with 4-horsepower engines were also shown.

The Portland people at the start were chary of the automobile show, as they had never attended one before. The price of admission, fifty cents, was thought a little too steep for the citizens of this town. But those who went the first day told their friends, and they told their friends, and the result was there were large crowds for the

Buffalo's Show in Prosperous Sway.

BUFFALO, March 5.—With the prospect that at its conclusion it will have been set down as the greatest event of its kind in this city, the annual exhibition of the Buffalo Automobile Trade Association, under the auspices of the Automobile Club of Buffalo, was opened in Convention Hall tonight in a "blaze of glory." This week all Buffalo, which is noted for its devotion to the motor car, will do homage to the imposing array of resplendent vehicles in the big hall.

During the greater part of last week Convention Hall was in the hands of the decorators and the result of their efforts is a scene of magnificent splendor. All the big iron girders and other network that support the roof have been artistically trimmed in ribbon effect, the colors being white and gold, with extra shadings for better results. From each girder is suspended a shield of white and gold, inscribed with the letters "A. C.," meaning Automobile Club. Electric lights are arranged to throw a light on these shields. Several thousand 16-candle-power lights have transformed the hall into a fairyland of brilliancy.

There was considerable trouble at former shows over the matter of display signs at the different booths. Each exhibitor had his own sign made as large as possible, so as to attract attention, with the result that many other exhibitors complained that the view of their signs was obstructed. This year the signs are more uniform. No sign is more than 2 feet 6 inches in depth, but the length, of course, is according to the frontage space of the exhibit. Each sign is hung at the same height, and each booth is carpeted in green.

There are fifty exhibitors, but there would have been many more had space been obtainable. For the last several weeks it had been Manager Dai H. Lewis's unvarying reply to would-be exhibitors that all space had been sold. The demand for space was so great that it would have been possible to extend the show to another building equally as large as the Convention Hall had it been obtainable.

The range of exhibits is very noticeably wider than at previous shows here, and the commercial vehicle occupies a most prominent position. Formerly only one foreign car had been shown in Buffalo, but this year three of the most noted European cars are on exhibition—Mercedes, Panhard and Renault. There is only one exhibit of tires, the management having decided the space formerly occupied in this line more valuable for other exhibits.

While other cities may boast of more automobile factories than Buffalo, none this side of the Atlantic boasts better, and the makers of the Pierce Arrow and Thomas Flyer are anxious to pit their favorites against the products of any factories across

the seas. One noticeable point about the new Pierce cars is the change in body lines from the curves which formerly marked the tonneau construction of Pierce machines to a body which may be described as almost severe in outline. It may be said, however, that there are no extreme changes in this year's Pierce cars over the machines of last year. The touring cars of the Pierce this year are 28-32 and 40-45 horsepower.

In the E. R. Thomas Motor Company's exhibit is seen the 50-horsepower Thomas Flyer and the cars developed from it by the substitution of various types of inclosed bodies for the usual touring car body. The well-known features of the Thomas models of last year are noticeable, despite the several changes made. The cars of 1906 do, however, excel last year's cars in point of finish and equipment.

The American Motor Truck Company is showing some trucks especially designed for heavy work. These trucks are noted for their durability and strength. The waterless Knox is shown at this show with a four-cylinder vertical motor mounted under the hood in front.

The list of exhibitors is as follows:

George N. Pierce Co., Buffalo; full line Pierce Arrow.
Babcock Electric Carriage Co., Buffalo; electric vehicles.
Cleveland Cycle & Auto Co., Cleveland; Eldridge, Waverley.
E. R. Thomas Motor Co., Buffalo; Thomas Flyers.
Walter Haynes; White steamer.
Poppenberg Auto Co.; Rambler, Marion, Corbin.
Jaynes Automobile Co.; Locomobile, Pope-Toledo, Pope-Hartford, Pope-Tribune, Oldsmobile, Buick.
Buffalo Motor Car Company; Autocar.
Buffalo Automobile Exchange; Haynes, Franklin.
Brunn Carriage Company; Stevens-Duryea.

J. A. Cramer; Premier, Stoddart-Dayton, Mitchell.

Centaur Motor Co.; Winton, Peerless, Cadillac, Northern.

Knox Automobile Co.; Knox.

Ford Auto Co.; Ford.

Buffalo Auto Truck & Motor Co.; Auto-trucks.

Palace Motor Car Company; Maxwell, Kane-Champlin, Reo.

American Motor Truck Co.; auto-trucks.

McNaughton & DuBroy; Mercedes, Panhard, Renault, S. & M.

Meadows & Hafer; St. Louis cars.

Buffalo Auto Station; National.

Buffalo Gasoline Motor Co.; marine motors.

The Kelsey Company; auto accessories.

Grey & Davis; lamps.

D. H. Lewis; automobile route books.

O. K. Machine Works; automobile accessories.

Swinehart Clincher Tire and Rubber Co.; tires.

C. E. Miller; automobile accessories.

Warner Instrument Co.; autometers.

Hartford Suspension Co.; shock absorbers.

Gloster Cycle Co.; motorcycles.

National Battery Co.; batteries.

Thomas Auto-Bi Co.; motorcycles.

Edmunds & Jones; lamps.

Neal, Clark & Neal; motorcycles.

Weed chain and Tire Grip Agency; non-slip chains.

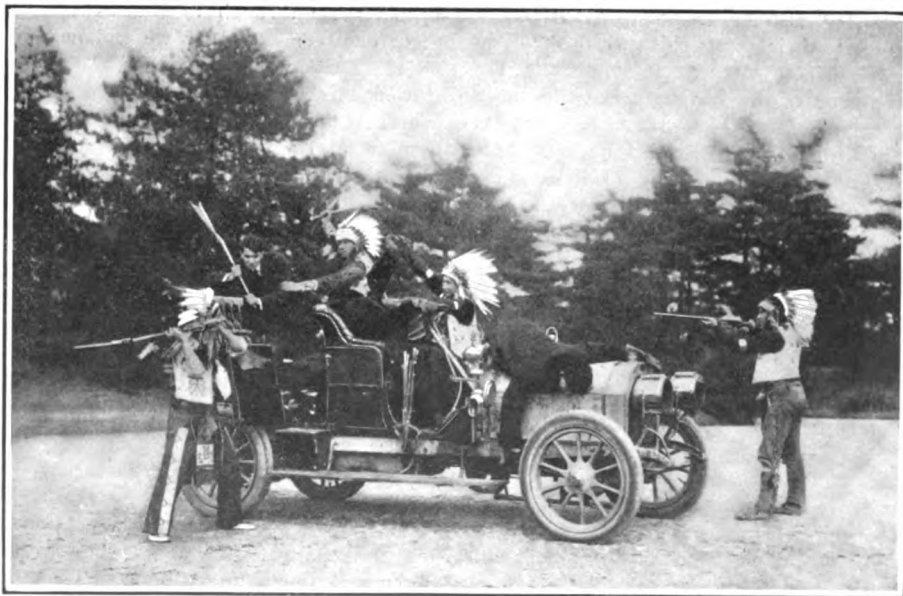
Thomas Spring & Gear Co.; new springs for automobiles.

Buffalo Carburetor Co.; carbureters.

"I thought I heard you refer to a radiator somewhere about this car," remarked Jack Hammond while enjoying a demonstration ride with E. R. Corder at the Chicago show with the mercury down at zero. "Where the deuce is the blamed thing?"

"Out in the hood," suggested Mr. Corder, pleasantly.

"Well," said Hammond, as he wrapped his overcoat more closely over his esthetic lavender waistcoat, "why the dickens don't you have it back here, where it would throw some heat to the passengers?"—Chicago *Inter-Ocean*.



INDIANS HOLD UP E. V. HARTFORD'S GOBRON-BRILLIE IN CENTRAL PARK, NEW YORK CITY.

Scenery Sublime; Roads Abominable.

ALBUQUERQUE, N. M., Feb. 28.—With our autometer registering 7,340 miles, we pulled up in front of the Alvarado Hotel in this city Sunday night, the exhaust from the unmuffled cylinders of the *Mountaineer* being audible for several blocks. Instead of having to spend the night out of doors with a tarpaulin spread over it, the car found a resting place in a genuine garage—the first seen since leaving Los Angeles.

The Rio Puerco river was crossed at Rio Puerco station, by means of the Santa Fe iron railroad bridge, the thirty-inch wheels bumping over the ties for a considerable distance after passing the bridge before a place was found where the car could run down the embankment onto the trail below in safety. While too rough to be enjoyable, the railroad bridge was found much safer than an attempted fording of the famous quicksand stream. The Rio Grande river was crossed on a long, narrow wagon bridge on the outskirts of Albuquerque. There was a ford across the Rio Grande near the Indian town of Isleta, but as the rear wheels of a large lumber wagon were plainly seen sticking out of the quicksand bed where it had been abandoned weeks before, we thought it best to go around via the old road and wagon bridge.

The sand is deep on the trail between Rio Puerco and Albuquerque, and we came most of the distance on low gear. Occasionally we would be obliged to take to the railroad track where some unusually deep arroyo loomed up, whose sandy banks plainly indicated that to cross would mean hours of work with windlass and cable.

At Isleta we arrived in time to witness the Indian dance, a sight worth going hundreds of miles to see. The Isleta Indians, a tribe of the Pueblos, are a farming nation, and after months of hard labor have just completed a huge irrigating ditch which connects their cornfields with the Rio Grande river. It was to celebrate the completion of this big ditch that the dance was given. Many Americans were present from all points on the Santa Fe to witness the ceremonies, while the road between Isleta and Albuquerque was pretty thickly sprinkled with teams and horsemen who had run down from this city to see the sight. The large public square in the heart of the Indian village was filled with painted, gorgeously-arrayed Pueblos, all dancing a slow dance and keeping time to some of the quaintest instruments in the drum and horn line I have ever seen or heard. The Indians did not seem to appreciate it, however, when we chipped in our share of the music by turning on our chime horn. In fact, several seemed to question our right to make music, and started in our direction. Both Fassett and I thought we had seen enough of the dance, anyway, so I threw in the clutch and the

Mountaineer charged through the crowd and started down the road for Albuquerque, where we arrived about an hour later.

Gasoline is very hard to secure in any of the smaller towns in this section, and is not for sale between Gallup and Albuquerque, 168 miles by railroad, and under ordinary conditions a week's run. The Standard Oil Co., or rather its western branch, known as the Continental Oil Co., has a large supply house at Albuquerque, and anything in the gasoline and lubricating oil lines can be secured there at very reasonable rates.

From Albuquerque we shall run up the mountains to Santa Fe, the capital of the territory. From there we expect to head



NEW MEXICO TRAIL THAT TESTS TIRES AND PATIENCE TO THE LIMIT.

toward Las Vegas and follow the Santa Fe railroad until western Kansas is reached. There we shall probably take the Union Pacific route through to Kansas City, as every one seems to think we will find better roads in going that way.

Albuquerque, although situated in the heart of the desert country, boasts of a number of automobiles, and everyone who owns one is filled to overflowing with enthusiasm. I have met the majority of owners, and all are greatly interested in our trip. In nearly every case the cars now in Albuquerque have been driven in under their own power, mostly from Denver. There are machines owned in Santa Fe, Las Vegas and Raton, although the trails out in this country are far from what Easterners would call ideal automobile roads.

We often wonder what that party of eastern automobilists on the New York-St. Louis run of 1904, who sent a petition to the Governor of New York state calling attention to the poor condition of the roads between Albany and Utica, would say if they were touring through the territory of

New Mexico, where there are no roads—only trails to follow—no bridges across the streams, and every second ford of a quicksand nature.

If I remember rightly, my name was one of those attached to that document, but lately I have been thinking that possibly those New York roads were not so bad after all; at any rate we would be glad to try them again soon.

PERCY F. MEGARGEL.

CLEVELAND AUTO SCHOOL.

Course Has Been Separated from Y. M. C. A. and Divided into Branches

CLEVELAND, March 5.—The automobile course in the educational institution of the Cleveland Y. M. C. A. has become so popular and so important that the management of the association has decided to make it a separate institution, to be known as the Young Men's College of Automobiling.

Beginning this week there will be several branches of the course. There will be a class for those who desire to become automobile salesmen; they will be instructed in the mechanism of a machine and taught the best methods of presenting the "talking points" of various cars. Then there will be another class for owners and prospective purchasers; to these will be taught the principles and methods of operating a machine, with instructions regarding repairs. A more extensive course has been mapped out for those who desire to become engineers and repairmen or chauffeurs. The ground-work will be laid in a series of sixteen lectures, illustrated with stereopticon views and parts of cars.

The shop laboratory will come next. Here students will be taught all that is necessary for a competent chauffeur to know.

Having satisfactorily passed through this course, the students will be given practice in the driving of the car. First, on a stationary car, they will be taught how to control the engine and handle the speed levers. Actual road practice will follow when the desired efficiency has been reached.

Louis J. Buschman, B.S., has been placed in charge of the school as principal. Heretofore he has been in charge of the evening classes of the automobile course, but in the future he will devote his entire time to this work. He is a graduate of the Case School of Applied Science, and has had several years of practical experience in the automobile and gas engine business. The instruction as mapped out will be of a thoroughly practical nature.

It is expected that a large number of owners and prospective buyers will join the classes, which will be held for them Tuesdays and Fridays at 4.30 P. M. Men who desire private instruction will also be accommodated. The class for salesmen and those who work in garages will meet in the mornings, when their work is lightest. There will also be classes every evening in the week.

A Lesson of the Quaker City Show.

Location Kept Away the Casual Amusement Seekers, but Exhibitors Satisfied with Presence of Real Buyers.

PHILADELPHIA, March 5.—When Saturday night, amid the strains of "Home, Sweet Home," accompanied by the "honk! honk!" of numerous horns, the Fifth Annual Automobile Show came to an end in the National Export Exposition in West Philadelphia, there was recorded such a success in management and results as will require the best efforts of the promoters of anything short of a national exhibition to equal. Judged by the only true test of such functions—the creating of interest in automobiles and the furthering of sales in every legitimate way—no local show ever held in this country can claim precedence. And when it is recalled that this success resulted despite the formidable handicaps of a location several miles distant from the business center, with a long walk from the nearest trolley line, the outcome is even more remarkable.

"But," as one of the management, who was also an exhibitor, remarked, "these very handicaps served the exhibitors in good stead. It kept away that undesirable class (to us, however welcome they may be from the box-office point of view), the idlers of a great city, who are attracted to any sort of an exhibition merely because they pass the doors and see crowds going in. Thus our material came to us already relieved of its froth, which probably accounts for the phenomenal business the majority of the exhibitors have done."

Coming from the city's center, the nearest the visitor could get to the show building was Thirty-fourth and Chestnut streets, which meant a third-of-a-mile walk down Thirty-fourth street to the South Pavilion. Just here the exhibitors came to the rescue. Between 1 and 2 o'clock in the afternoon and between 7 and 8 in the evening, the entire force of demonstrators had orders to make part of an impromptu automobile transportation line, with the result that thousands of visitors were whirled from the trolley cars in jig time, a constant stream of cars keeping up the procession along Thirty-fourth street during those hours.

The public was possibly not so fortunate in getting a "lift" on the return trip, but the ride—possibly the first in the experience of many of them—left an impression which may well be charged to "missionary effort" and show a possible dividend at some future day. The Knox bus was in constant service—free—during show hours, day and night, assisted at times by the Reo bus. A big 3-ton demonstration truck of the Universal Motor Car Company, of New York, was also pressed into service at times, and as it made its stately way up Thirty-fourth street after the show, with

its half a hundred standing passengers, the ease with which it walked away with its tons of living freight was frequently and favorably commented upon.

No better idea as to just how successful the show has been can be had than from the expressions of those exhibitors who have as yet no permanent representation here. For instance, Manager Picard, of the Rainier, said: "It seems to me that the majority of visitors were buyers. The show was a magnificent success, and I predict excellent business for the branch house which we propose to establish here as soon as we can secure a suitable location."

A. L. Bennett, manager of the Mors exhibit, was similarly enthusiastic. "I not only sold the two cars which constituted the Mors exhibit, but several others. The show has been a success from every viewpoint."

W. H. Woods, of the Napier exhibit, was gratified with the success which his car had met here, and owned up to several sales. Same way with S. S. Thornton, of Smith & Mabley, several of whose exhibition cars were taken from the show before its close by purchasers who insisted upon immediate delivery.

Similar tales are told by all the local agents. The Rambler manager, W. F. Smith, gathered in deposits on no less than sixteen cars, not to mention the placing of seven agencies and additional orders from those already established.

The Ford made a decided hit, and actual orders exceeded a dozen, with demonstrations so numerous as to insure a big return before many days.

Manager E. C. Johnson, of the White Garage, lauded the show for the reason that it has "demonstrated to Philadelphians that it was not necessary to go to New York to make purchases, as many have hitherto done."

These few instances give an idea of the general tenor of the opinions on the subject solicited by THE AUTOMOBILE correspondent.

In the upper hall, where the sundries men held forth, the expressions of gratification at the excellent results of the week were general. All of them who were approached on the subject owned to steady sales all the week. The Voorhees Rubber Co. representative, who was taking orders for tire repairing, took deposits on \$1,400 worth of business during the week. Shock absorbers at from \$30 to \$60 a set are a somewhat expensive proposition, but all the demonstrators of those useful attachments filed many orders. Same way with tires and horns and lamps, and—but what's the use? Success, with a large block letter "S," was the key-note all along the line.

The enthusiasm reached the promoters about the middle of the week, when they saw how things were going, and—*mirabile dicta!*—they are actually already engaged in planning for next year's show. Fact! They feel so confident now, that distance from the city's center bothers them not a bit. When nearly 60,000 people will pay 50 cents a head—a not very popular price for Philadelphia shows, by the way—after coming nearly three miles in the trolley cars and walking, many of them, more than a half mile getting to and from the show, the managers argue, no anxiety need be felt on this score in the future. For Philadelphia before many years—possibly ere another year shall have rolled around—will have a convention hall larger than Madison Square Garden, if not so well located. By that time the pavilion in which last week's show was held will be in use in an addition to the Philadelphia Almshouse.

Should the projected convention hall not be ready—the proposed site for it, by the way, is on the Spruce street end of the same plot, all of which is owned by the city—the 1907 show can be held in the main hall of the old Transportation Building of the Export Exposition, which, when heated and lighted, even temporarily, will house a show, on one level, larger than either the New York or Chicago exhibitions.

SUPRISING STATE OF MICHIGAN CARS.

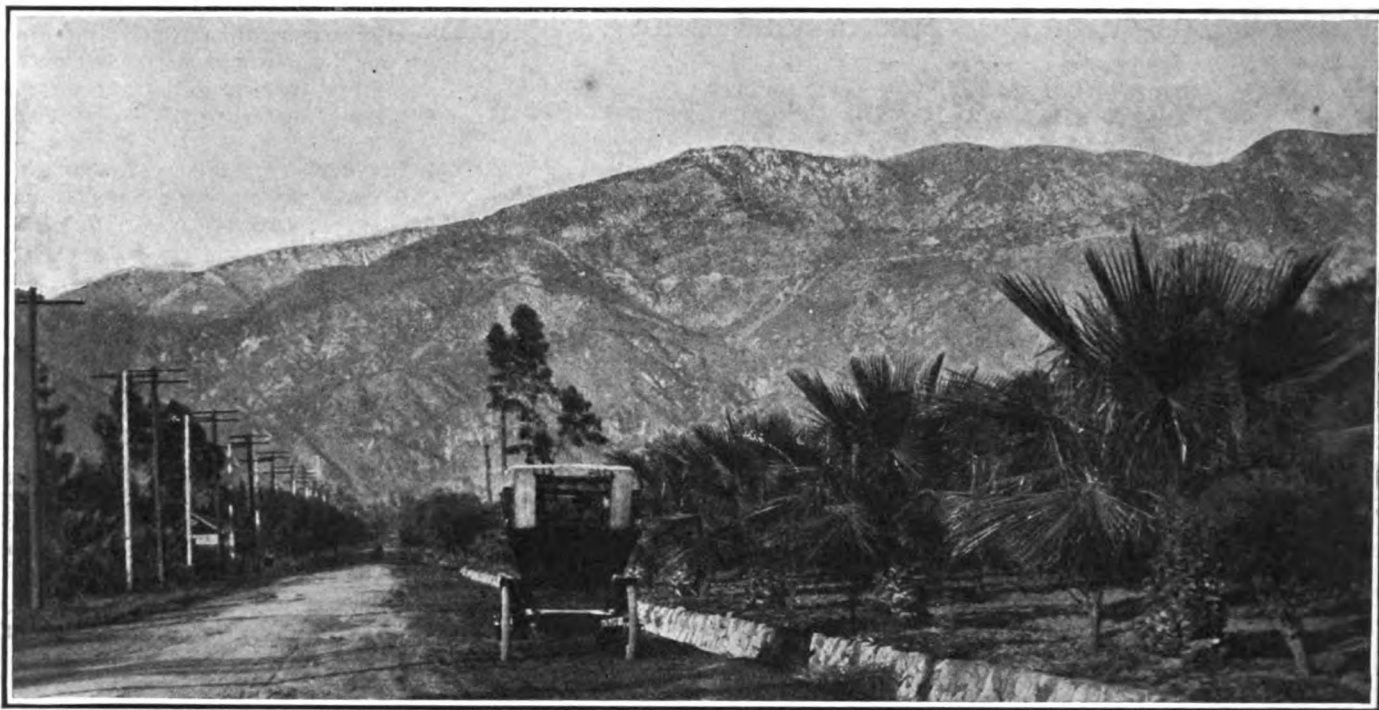
GRAND RAPIDS, MICH., March 5.—The automobiles of Grand Rapids are in a very bad condition; their tires are punctured; their engines refuse to work; they are in the repair shop half the time. New cars must have a great deal of work done upon them; some have to be rebuilt entirely. The evidence tends to show that of the entire 300 machines in town, scarcely one is in condition to whiz along the streets and fill the heart of the owner with joy.

These startling facts might never have been discovered had not the local board of assessors undertaken to place the automobile on the tax lists. Faced with the certainty of taxation, the owners have begun to tell the assessors what poor machines they have.

The taxation of automobiles is a new wrinkle here. Behind it appears the hand of the state tax commission so far as can be determined by 300 notices which the assessors have sent out to all local owners of automobiles and which read like this:

"We find your name in the list of owners of automobiles furnished by the tax commissioners as owner of No. — (here is given the number of the owner's license). We enclose blank statement of personal property for taxation. In making your statement, please give the cost and present value of your automobile. If you have sold your machine, please give name and address of purchaser."

The assessors have already secured a multitude of statements in reply to this communication.



THE PASADENA-ALTADENA CLIMB HAD A MOST PICTURESQUE SOUTHERN CALIFORNIA SETTING.

A Notable California Hill Climb.

LOS ANGELES, March 3.—The Pasadena-Altadena hill climb on Washington's birthday was one of the most successful automobile events ever held in Southern California. An ideal California day greeted the climbers and onlookers; poppy fields were ablaze in yellow, and many visitors stooped to gather the California flower. The honors went to the Thomas, Stoddard-Dayton, Reo, Buick, and Franklin, each winning the first prize cup in its event. The affair was conducted by the local Dealers' Association, with H. D. Ryus chairman of the committee in charge.

The road used for the climb starts near the outskirts of pretty Pasadena, and goes almost straight north for four miles to the foot of the mountain. There are two turns, both very sharp. For the first mile and a half of the climb the grade is not over 8 per cent., and there was plenty of speeding along this stretch. The grade gradually increases until it is close to 15 per cent. at the top. The run is through a beautiful bit of country. As one goes higher and higher, the magnificent valley, one of the most beautiful in California, stretches out for miles and miles. Twenty miles to the south the peaceful Pacific sends up a silvery greeting, and in the distance can be seen the dim outline of Catalina Island.

Interest naturally centered in the open event for all touring cars, and it was in this contest that a 50-horsepower Thomas Flyer, owned by Thomas Hughes and driven by Frank Seifert, won the big cut glass punchbowl given for the fastest time of the climb. E. R. Thomas, of the company

making the car, was a pleased spectator of the victory, and expressed himself enthusiastically. "It was a beautiful place for a hill climb," said he, "and I shall always remember with pleasure my day at the foot of the California mountains."

The Pasadena-Altadena climb is to be made an annual event, and the citizens of Altadena have promised to construct a road which will eliminate the curves, and it may be extended farther north and include a stiffer grade. The following is a summary:

Runabouts Costing \$1,000 or Less—Won by Dr. Brown, 22-h. p. Buick; time 6.07 1-5. F. A. Bennett, 14-h.p. Ford, second; time 7.07. E. Bennett, Jr., 16-h.p. Wayne, third; time 7.25 1-10.

Runabouts Unlimited—Won by D. C. McCann, 30-h.p. Franklin; time 6.32 3-5. H. D. Ryus, 18-h.p. White, second; time 7.14 1-5.

Runabouts Costing \$1,500 or Less—Won by Dr. Brown, 22-h.p. Buick; time 6.05. L. T. Shettler, 16-h.p. Reo, second; time 6.41 1-2. F. A. Bennett, 14-h.p. Ford, third; time 6.48 2-5.

Touring Cars Costing \$1,500 or Less—Won by L. T. Shettler, 16-h.p. Reo; time 6.47 2-5. Mr. Hamilton, 22-h.p. Buick, second; time 7.35 1-5. D. L. Wolf, 18-h.p. Reliance, third; time 8.09 3-5.

Touring Cars Costing \$2,500 or Under—Won by H. L. Olive, 30-h.p. Stoddard-Dayton; time 6.26 2-5. Earle Anthony, 20-h.p. Stevens-Duryea, second; time 7.03 2-5. E. H. Hawes, 24-h.p. Frayer-Miller, third; time 7.03 1-5.

Touring Cars Unlimited—Won by Thomas Hughes, 50-h.p. Thomas; time 4.58 1-5. Western Motor Company, 35-h.p. Pope-Toledo, second; time 5.04 3-5. E. C. Anthony, 35-h.p. Pope-Toledo, third; time 5.06 3-5.

The Vanderbilt Cup Course.

The residents of Nassau county, Long Island, are very much interested as to the location of the course for the next Vanderbilt Cup race. So interested are they in the matter that petitions are being circulated throughout Nassau county which will be presented to the Vanderbilt Cup Commission, asking it to select the Long Island Circuit for the next race.

The 1905 course was a fairly good one, but the "S" turn at Albertson's and the dangerous one in the Guinea Woods can be avoided. This can be accomplished by selecting a new route from the Bull's Head Tavern, in the North Hempstead road, to Lakeville, thus avoiding the Back road and Willetts road, these being the poorest stretches.

President John Farson, of the American Automobile Association, will announce the completion of the new racing board within the next few days. It is understood that Chairman Robert Lee Morrell positively declines a reappointment.

April Race Meets.

Arrangements are being made for a race meet at Pablo Beach, Jacksonville, Fla., to take place April 4, 5 and 6. The meet will be under the auspices of the Jacksonville Automobile and Motor Club, with W. J. Morgan assisting in its management.

During Easter week at Atlantic City the Atlantic City Automobile Club will hold a meet on the beach. The program will be a diversified one, and will provide for touring cars and runabouts in addition to the two races for the high-powered flyers. Entry blanks will be issued in a few days.

Wilkes-Barre Mountain.

WILKES-BARRE, PA., March 5.—The one hundredth anniversary of the founding of Wilkes-Barre will be observed on a grand scale, and one of the feature events will be a climb of the famous Wilkes-Barre mountain, which possesses a two-mile stretch of perfect road and one of the most picturesque in the country. The Centennial Jubilee will be held May 10, 11, and 12, and the hill-climb is scheduled for the opening day.

Wilkes-Barre being only seven to ten hours' reasonable run by automobile from New York City, it is expected that many participants and spectators will be present from the metropolitan district, in addition to those from Philadelphia, Harrisburg, and other Pennsylvania cities. The route from New York City to Wilkes-Barre is over excellent and passable roads, and through diversified scenery.

The Wilkes-Barre Automobile Club hopes to make the climb up the mountain here the successor of the Mount Washington event, which it is understood will not be held this year. The Wilkes-Barre Board of Trade, which is in general charge of the Jubilee details, is enthusiastic concerning the hill climb, and will use its best efforts to make the contest national in character. Entry blanks will be issued in the near future, and definite plans announced. The abandonment of the Eagle Rock hill climb adds importance to this event.

Substitute Bill in New Jersey.

TRENTON, N. J., March 5.—A substitute bill for his obnoxious measure which caused so much antagonism has been introduced by Senator Frelinghuysen. It must be confessed that the substitute is almost as drastic as the original bill, for it carries a provision authorizing arrests without warrant and subjecting automobilists to the mercy of the country constable anxious for a fee.

It is a certainty that the Associated Automobile clubs of New Jersey will meet this last measure with a solid front. Chairman W. F. Sadler, Jr., of the Law Committee, and Secretary J. E. Gill are already busy on the proposition.

In the substitute bill there is provided a somewhat lower tax on automobiles than the original calls for. It provides that all cars of less than 30 horsepower shall be taxed \$3 per year and a dollar additional for the chauffeur. Machines of 30 horsepower and more are to pay \$5 per year, with an additional \$2 for the driver's license.

The substitute, Senator Frelinghuysen claims, is modified sufficiently to meet all requirements, and he says he will do his utmost to have it passed.

While the law-abiding automobilists have the utmost scorn for their fellow-autoists who make themselves "hogs of the road," still they do not consider it fair that the entire sport should suffer because of these "outlaws." They will fight and fight hard against unjust legislation.

Aeronautical Matters.

Comte de la Vaulx, the well-known French aeronaut, is expected to reach New York in the near future, and probably will be present at the next ascension of the Aero Club of America.

The Aero Club of America is negotiating for a plot of ground near Pittsfield, Mass., and it may decide to establish permanent experimental headquarters at that place. It will be necessary to establish a plant for making hydrogen gas.

Professor Samuel Pierpont Langley, third secretary of the Smithsonian Institute, and particularly noted for his airship experiments, died recently at Aiken, S. C., as the result of a stroke of paralysis. Professor Langley was 72 years of age, and it is said that he spent \$100,000 of his private fortune in trying to solve the problem of human flight.

The technical committee of the Aero Club of Great Britain, whose principal functions are the investigation of aeroplanes and flying machines of the heavier-than-air type, has been constituted for 1906 as follows: Sir Hiram Maxim, the Hon. C. S. Rolls, Sir H. E. Colville, Major Baden-Powell, Colonel J. E. Capper, Mr. Frost, Mr. Pollock, Mr. Alexander, Mr. Spencer, Mr. Simms, Mr. Wallace, K.C., Mr. Moore-Brabazon, Dr. Hutchinson and Professor Huntington. Some interesting competitions in connection with this important branch of aeronautics are to be organized by the committee.



NEAR THE FOOT OF THE WILKES-BARRE (PA.) MOUNTAIN WHICH WILL BE CLIMBED DURING THE MAY CENTENNIAL JUBILEE.

Patents

Dust Preventive.

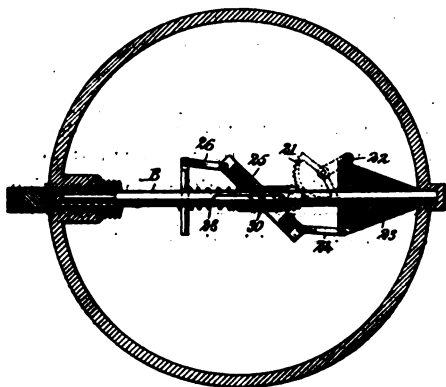
No. 813,389.—W. M. Sandison, of Ashfield, Ayton, Scotland.

An emulsion of "wool-fat" or "wool-wax" obtained from unwashed wool by washing with soap. The "wool-fat" contains also potash salts, which by their hygroscopic character prevent the road from drying; and creosote, or some similar substance, is added to the emulsion to protect it from decomposition.

Speed Indicator.

No. 813,135.—B. Volkmar, of New York City.

A device depending on the centrifugal force exerted by a metal ring, 25, when rotated by a shaft, B. The ring is pivoted on a diametrical pin, 30, which is slidable in a slot in the shaft. At one point the



VOLKMAR SPEED INDICATOR.

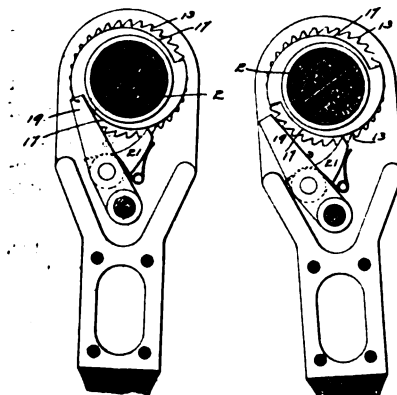
ring is pinned to a link, 26, and a spring, 28, tends to force the ring into the angular position shown. As the shaft revolves, the ring tends to assume a position at right angles to the shaft, and the effect of holding it by link 26 is to double the movement of link 24. The rotating cone 23 determines the position of the index finger through the parts 22 and 21.

Safety Starting Crank.

No. 811,928.—A. S. Johnson, of Minneapolis, Minn.

The principle on which this crank acts is shown in the drawings. The crankshaft 2 has a double toother ratchet 17 pinned

fast to it, and adjacent to that is a ratchet 13 which is connected (by means not shown) to the frame of the car and is stationary. Pawl 19 engages ratchet 17,



JOHNSON SAFETY STARTING CRANK.

and pawl 21, mounted on 19, engages 13. If the engine "kicks back," the first backward movement of the crank causes 13 and 21 to force 19 out of engagement, as shown in the second figure.

Transmission Mechanism.

No. 806,316.—C. E. Bertels, of Wilkes-Barre, Pa.

This is a sliding gear transmission in which the usual friction clutch between the engine and the gears is supplemented by a second friction clutch between the gears and the differential, in order to let the gears run entirely free instead of at a speed determined by the speed of the road wheels when a change of gears is made. This, of course, reduces materially the shock of changing gears. The two clutches are operated simultaneously.

Muffler.

No. 813,203.—G. E. Franquist, of New York City.

This muffler is stated by the inventor to deaden the sound of the exhaust gases without back pressure, by utilizing the principle of interference of sound waves. The gases enter the chamber 6 by pipe 9 and pass by a great number of small perforations through plate 10 into chamber 7. The gases thus issuing take on the characteristics of a sound wave, which wave is reflected back and forth between plate 10 and plate 12. Somewhere midway between these plates the waves will interfere, with

the result that at that point there is no sound. Therefore the gases are taken from that point by pipes 13, and are further expanded in chamber 8 before their final discharge at 14.

Tachometer.

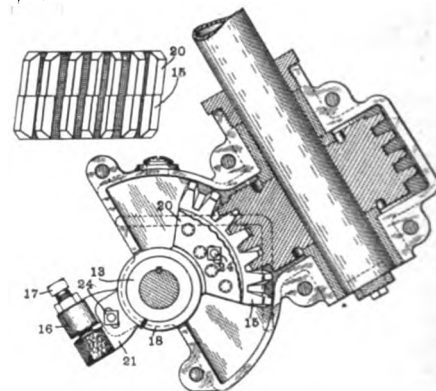
No. 812,937.—V. Koblizek, of Salmthal, Austria-Hungary.

A tachometer operating like a Pickering governor, with flyballs on bent leaf springs attached at one end to the shaft and at the other to a sliding sleeve actuating the index finger through a rack and pinion. A pair of clapper weights on the sleeve strike a signal gong when the speed reaches the predetermined maximum.

Adjustable Steering Gear.

No. 813,186.—J. Warrington, of Indianapolis, Ind.

This is a worm gear in which the worm wheel is split into two parts 15 and 20, of which the latter is swiveled by 18 on the hub 13 of the former. The two halves are held together by bolts 24 in slots, and the purpose is to offset 20 slightly on 15 to compensate for wear. This is done by a locked set-screw 17 threaded in an extension 16 of 13, and bearing against a stiff spring in extension 21 formed on 18. The purpose of the spring is to permit the seg-



WARRINGTON STEERING GEAR.

ment to be adjusted snug for the middle part of its travel, where it will suffer the greatest wear, and yet be free at the ends.

Gear-Driven Blower.

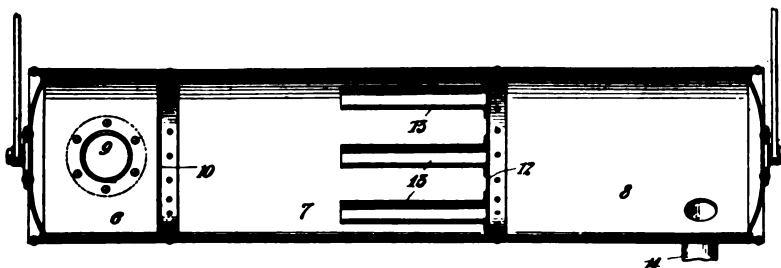
No. 813,204.—L. A. Frayer and W. J. Miller, of Columbus, O.

A centrifugal blower geared to the crankshaft of an air-cooled motor, and protected against shocks due to sudden starting and stopping by a spring cushion in the driving gear.

Gas Engine.

No. 811,757.—V. G. Apple, of Dayton, O.

An automobile engine placed vertically at the front of the car, and having the valve and other mechanism disposed within casings fitting close to the cylinders, so that no bonnet is required.



FRANQUIST MUFFLER UTILIZING PRINCIPLE OF SOUND-WAVE INTERFERENCE.

A Trying Non-stop Run in Winter.

PHILADELPHIA, March 6.—Nowadays it is not a difficult matter for an automobile to travel 1,000 miles without a stopping of the motor. To accomplish the feat under severe conditions of road and weather is a task more difficult of accomplishment.

A Rambler car, fitted with a double-

from Lancaster, a hole was encountered into which the car sunk over the axles. One hour and twenty minutes elapsed here, but the car was finally extricated by its own power without stopping the engine. At each town many interested spectators were given trial trips, though the demand was so great



NON-STOP RAMBLER WHICH PLOWED THROUGH MUD OVER ALL KINDS OF ROADS.

opposed motor and selling at \$1,200, started Tuesday noon, February 20, from 242 North Broad street, Philadelphia, and, going through the hilly section around Ogontz, it covered a 38-mile circuit until a 1,000 mileage had been accumulated.

During all of one day and night the car plowed through mud and water in one of the worst rain storms of the year, the mud being in some cases nearly to the hubs. When finally stopped by Senator Vivian S. Gable, the engine had been running continuously for 96 hours, 6 minutes, and the car had covered 1,383 miles under the worst conditions ever encountered by an automobile. During the run the car was in charge of J. E. Baugher, C. B. Cleaver, Herbert Bittner and Joseph Kachline, the last two named making the final relay of the thousand miles.

At the completion of the original undertaking of 1,000 miles the car was going so smoothly that it was decided to continue the run; but as the operators were all entirely worn out through exposure to wind and rain the car was left standing with the engine running until 9 A. M. Friday, when Joseph Kechline and Herbert Bittner started on a 250-mile round-about trip to Harrisburg. At places the roads were all but impassable, and about four miles from Harrisburg the three passengers had to go ahead of the car and pick out the road with the dash lamps, and finally, about twelve miles

that not all could be accommodated. After returning to Philadelphia a number of trips were made around the city, the engine being finally stopped by Senator Gable and the car taken to the Rambler booth at the Philadelphia show.

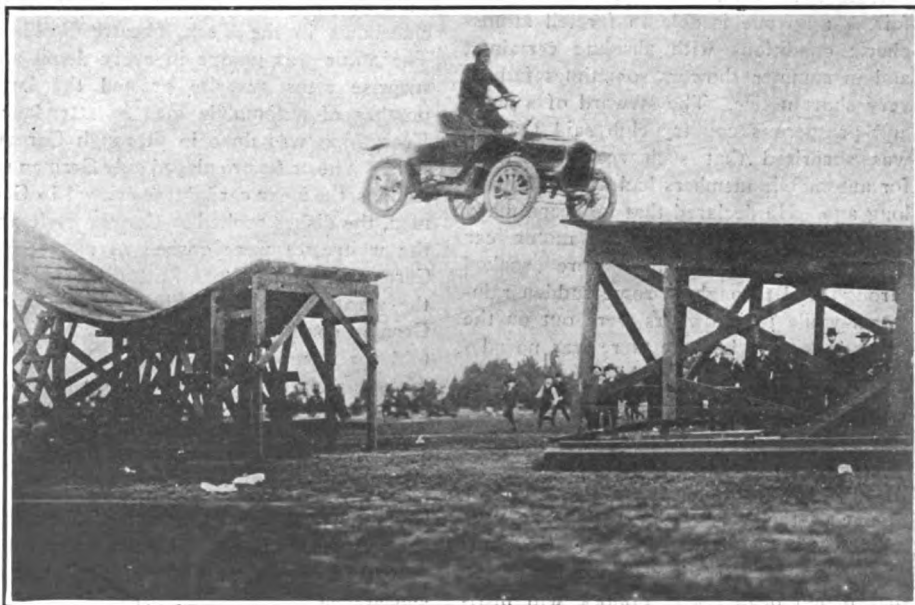
New A. A. A. Officials.

President John Farson and Secretary

Sidney S. Gorham, of the American Automobile Association, have been in New York City since March 1, and have conferred with members of the Board of Directors concerning plans for the immediate work of the organization. Both officials are known to be energetic and capable, and A. A. A. affairs are certain to be given requisite attention. President Farson has been a persistent opponent of unfair legislation, and Secretary Gorham, being a lawyer, will give much attention to this department of the national body. The A. A. A. Board of Directors held its March meeting this afternoon at the clubrooms of the Automobile Club of America. Substantial growth is assured the association in the next year.

Creates Thrills on the Coast.

A thirty-foot leap with an automobile across a gap at the foot of a steep incline is a performance with which Doctor Carver has recently been thrilling spectators at Agricultural Park, Los Angeles, Cal. After making a score of such sensational leaps in that city he planned a tour of California with his new "stunt." The accompanying reproduction from a photograph shows the "Doctor" in the midst of one of his wild flights. As shown, the essential equipment is a wooden incline ending at the bottom near the ground in an abrupt upward curve, forming the segment of a circle. Thirty feet distant is a sort of landing platform upon which the car alights after its leap. There is nothing but the driver's steady nerve and hand to hold the car to its course. The machine used for this feat is a second-hand Cadillac runabout of 1905 model bought from the Lee Automobile Company, of Los Angeles after it had seen six months' hard usage on the road. The leap is a very severe test of the springs, axles, and, in fact, all parts of the car, as may easily be imagined.



THE CADILLAC RUNABOUT WHICH LOOPS THE GAP AT LOS ANGELES, CAL.



THE MORRIS COUNTY (N. J.) GOLF CLUB, WHICH WILL PROVIDE FOR ITS AUTOMOBILING MEMBERS.

Providing for the Automobilist.

ASBURY PARK, N. J., March 5.—A matter of interest to automobilists all over New Jersey is the announcement that the Morris County Golf Club, one of the wealthiest organizations of its kind in the state, may erect a garage on its grounds this spring for the use of members and their friends owning automobiles.

While country clubs provide almost every known convenience and comfort for members, most of the New Jersey clubs seem to have forgotten the automobilists' needs in this respect, and take no account of the expensive cars that are driven to the grounds. There are usually stables for horses at those places patronized by horsemen, but automobilists must leave their costly cars out in the open or else house them in ill-smelling stables or under rickety sheds.

It is not so bad when the weather is fair, but no one is able to foretell atmospheric conditions with absolute certainty, and in summer showers sometimes fall on very short notice. The steward of a large and prosperous country club said that he was surprised that such accommodations for automobile members had not been made long ago. He declared that he heard many complaints last season from motor car owners whose machines were soaked through and through in some sudden rain-storm while their owners were out on the grounds, simply because there was no adequate shelter for automobiles.

John Pollock, who lives in the Seventh District, Wilkerson, Tenn., rode horseback to Antioch and hitched his horse in front of one of the stores. An automobile used by the Cumberland Telephone Company came along and frightened the animal so that it fell dead. Mr. Pollock will institute suit against the company for damages.—Exchange.

Doings of the Clubs.

The Automobile Club of Macon (Ga.) has been revived, and its new offices promise an innings of great activity, particularly in the matter of working for roads improvement.

At the regular "Tuesday Night" of the Automobile Club of America a large number of members attended the illustrated lecture of Frederick Moore, the subject being "Brigand Life in the Balkans." Mr. Moore, as an Associated Press correspondent, spent much time in the Balkan country.

The Springfield (Ohio) Automobile Club recently held its first annual banquet. After the banquet the old board of directors was reelected as follows: P. A. Staley, J. K. Williams, C. W. Russell, H. C. Downey and A. F. Sparks.

A banquet and entertainment surpassing by far every past effort of the Automobile Club of Buffalo recently took place in its clubrooms in the Teck Theatre Building. The affair was unique in every detail and surprise after surprise greeted the large number of automobile men in attendance. Everything was done in thorough German style. The orchestra played only German selections, the menu cards were printed in German, the dishes cooked in German style and the waitresses were garbed as picturesque German peasant girls. Of the many surprises the greatest was the springing of a bogus German count. President H. A. Meldrum told the members they were to be favored with an address by Count Von Unholz, who had made a special trip to Buffalo for the occasion. The listeners were just getting interested when the alleged count removed his whiskers and wig, disclosing himself to be Howard D. Herr, chairman of the entertainment committee. A good vaudeville entertainment followed the "fake" count's appearance. H. S. Evans, of Pittsburg, a member of the Automobile Club of Pittsburg, was a guest.

Chicago's Motor Boat Show.

CHICAGO, March 5.—The promoters of the first annual power boat and marine engine show, which is to be held here at the First Regiment Armory, April 7 to 14, expect that fully 100 exhibitors will take part in the show. Already nearly all of the space has been spoken for by different firms, and it looks as though Chicago's first show will set a record which will be hard to beat, in the West, for some time to come.

At the regular quarterly meeting of the Columbia Yacht Club it was decided to make power boats a feature of the season's schedule. Long cruises will be taken to ports along the Lake Michigan coast, but short-distance racing will not be tolerated. Able, seaworthy boats will be used. Howard Shaw was appointed chairman of the Power Boat Regatta Committee, with authority to select the rest of the committee.

On the Delaware River.

WILMINGTON, DEL., March 5.—Motor boats are becoming so numerous on the Delaware river that a motor and engine works has been established at Newcastle, which is about five miles below Wilmington and about thirty miles below Philadelphia. The plant is now being equipped with machinery, and it is the expectation of the owner to have it in shape by the time the shad season is under way, which will be about the middle of this month.

Newcastle is at the head of deep water, being but a short distance above the Delaware Bay, and is the center of the shad fishing industry. Formerly only row boats and sail boats were used by the shad fishermen and oyster dredgers, as well as the Jersey truckers, in taking their produce to Wilmington and Philadelphia, but now many of the boats are operated by motors, and the fever is spreading. The gain in time and the all-round convenience of the motor-driven craft are now generally recognized.

Sunset Two-cycle Touring Car.

THE car here illustrated, although made in considerable numbers during the past season, is practically unknown except in the vicinity of San Francisco, where it is manufactured by the Sunset Automobile Co. A sample car has reached New York, where it has attracted attention by its clean cut lines and silent running.

The car possesses direct individuality, but the most novel detail is found in the motor, a two-cylinder, two-cycle, vertical engine placed in front with drive through planetary transmission and propeller shaft to the divided rear axle. The motor is the result of experimentation by Dorville Libby, Jr., manager of the Sunset company, and the present form was designed about four years ago, business conditions preventing its construction in a commercial form until the fall of 1904. A season's experience has not indicated the advisability of any alterations, and the model for this year is practically the same as the motor in use last year.

The difficulty often encountered in two-cycle practice of effective transference of the charge from the crank chamber to the cylinder at high engine speeds has been minimized in the Sunset motor by providing an increased initial compression of the gases in the crank chamber, which is made with as little clearance as possible, increasing the pressure of the burnt charge by reducing the cylinder clearance and by enormously increasing the area of the cylinder ports. Wire-drawing or choking the admission of the charge has been avoided by extending the ports entirely around the internal circumference of the cylinder, bridges of course being used, and by so shaping the head of the piston that more perfect separation of the incoming and outgoing gases is effected. The three-port system is not used, there being a check valve in the intake pipe.

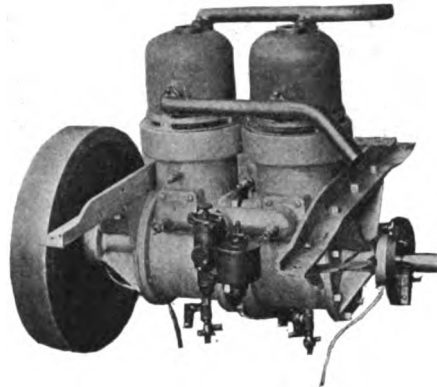
The resultant design is said to provide a two-cycle motor that will run at a greater number of revolutions per minute than a four-cycle engine with valves of a normal size and which will run slower than a four-cycle engine with a flywheel of equal size.

The 10-horsepower engine used in the runabout has two vertical cylinders of 3 1-2-inch bore by 4-inch stroke, with copper water jackets. The crankshaft is of built up construction with cast disk counterweights on the hardened and ground shaft. The bearings are solid phosphor bronze bushings, which have given satisfactory service in the cars now in use. Ignition is by jump spark, with the timer on the front end of the engine shaft, as shown in the accompanying illustration of the motor.

The use of a two-cylinder motor of the two-cycle type has enabled the company to produce a car light in weight with nearly all of the frame area available for passen-

gers or luggage. The total weight of the runabout is 850 pounds, notwithstanding the moderately long wheelbase, 84 inches, and the substantial construction of the axles and other structural parts. The tread is 45 inches, with wheels 28 inches in diameter, shod with 3-inch tires.

The motor is not only free from the gears, camshafts and valve mechanism of the four-cycle type, but the wiring is simple and direct by reason of the use of



SUNSET TWO-CYLINDER, TWO-CYCLE ENGINE.

a single coil with secondary distributor. The open and clean-cut appearance is still further enhanced by the absence of pump and driving mechanism, the water circulating by thermo-syphonic action.

The engine is set into the frame at an angle, with the design of affording a direct line of drive when the springs of the car are under normal compression. The transmission provides two forward speeds and a reverse, though the reverse gives an addi-

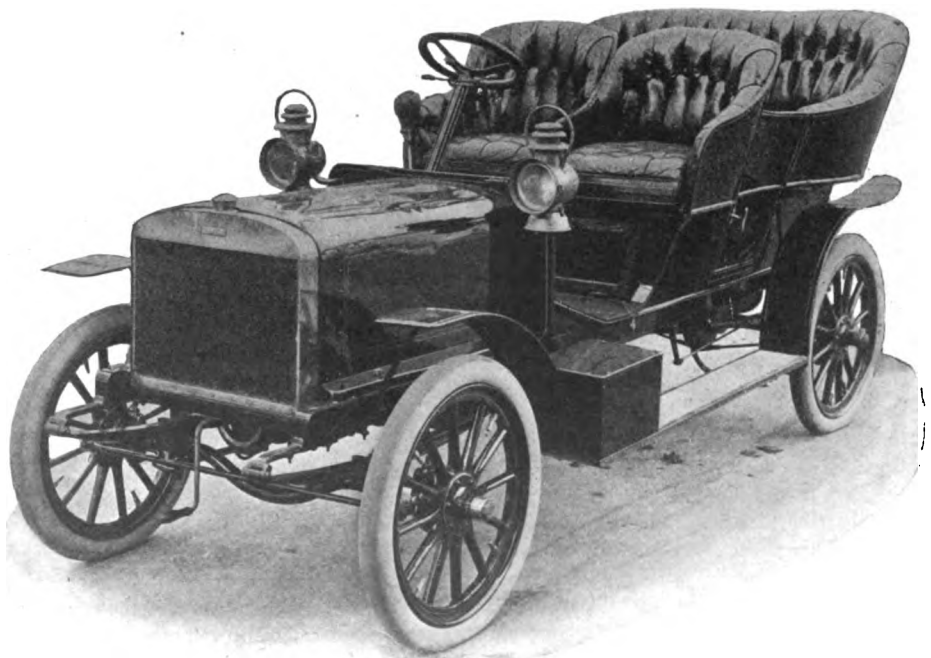
tional forward speed brought about by its engagement with the motor reversed or running in the opposite direction to normal. The high speed is direct drive with a maximum rate of about thirty-five miles per hour, the low, two and a half miles, and the reverse, also an additional forward speed, six miles per hour. Speed changes are effected by movement of a single side lever.

The brakes, acting on the drive shaft and on the differential, are foot actuated. Spark and throttle levers are located below the steering wheel, moving over notched quadrants. Hand-operated muffler cut-out is provided for emergency use.

In the construction of the frame straight-grained ash is used with steel flitch plates. The springs are three-quarter elliptics, shackled at the rear ends. The driving and braking stresses are taken by the springs. The rear portion of the body is flat, a boot or turtle type of back being removable so that a surrey seat, a duplicate of the permanently attached front seat, may be bolted in position to double the passenger carrying capacity of the vehicle.

A new model, an amplification of the runabout, will be added to the line this year, and already work is in hand on a number of the larger cars. This model will be equipped with a four-cylinder, two-cycle motor rated at 20 actual horsepower, shaft drive and dimensions increased here and there as necessary in a car of this power.

Although the new model will possess a power plant of twice the rating of the runabout, the question of total weight has been so carefully worked out that the four-cylinder car will weigh only a little more than the smaller machine.



SUNSET 20-HORSEPOWER TOURING CAR DRIVEN BY FOUR-CYLINDER, TWO-CYCLE ENGINE.



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The Era of Highway Improvement.

From all over the country accumulates information that makes apparent the widespread era of highway improvement that is just dawning in these United States. The city dweller, the town inhabitant, and the farm owner are now all agreed—except in a gradually lessening number of cases—that the common welfare demands an early improvement of the road arteries of travel.

In order to avoid the insinuation that he was working for good roads so that he might have perfect highways over which to drive his automobile, the motorist has pursued a policy of keeping very much in the background. Perhaps this plan may have been a wise one before automobilists became as numerous and substantial as they are to-day, but the impression is growing that the time is at hand when this large class of taxpayers—and nearly every automobilist is a taxpayer—should come out in the open and fight for that which not only benefits them, but is an advantage to all users of the highway, and to thousands of others who benefit indirectly.

The cyclist never hid in the underbrush in his persistent advocacy of good roads, and he talked the subject from morning until night, and unquestionably accomplished much in the way of moulding opinion to its present almost unanimous state. It is time for the thousands of automobilists throughout the broad land to place themselves squarely on record and announce in no uncertain manner that they intend to leave no stone unturned to bring about this prompt improvement of roads—the ignoring of which has been a matter of profound surprise to foreign countries who have studied our progress and prosperity.

The Brownlow-Lattimer good roads bills still slumber in Congress, and apparently are sidetracked for measures involving money expenditures in which the politicians have a greater interest. Our representatives in Congress must be taught that the good roads subject must not be longer ignored, and the only way in which this can be more quickly accomplished is for the growing army of automobilists to make their fight open and aboveboard, and not skulk in the background, fearing that their support will prove detrimental. Simply because a few reckless automobilists antagonize other users of the road is no reason why the great majority should hide their efforts in this most essential channel.

Government aid is close at hand, but it will not be obtained speedily through the methods now being pursued by automobilists. Let us not be ashamed of admitting that we do desire good roads over which to drive our automobiles, for this improvement of the highways, to quote from a Brownlow-Lattimer argument, "is a national obligation, because improved highways would bring national blessings where now exist conditions that are hurtful to national life and prosperity."

Patent Law Reform.

Several years ago, as the result of agitation on the subject, a bill was presented to Congress, having for its purpose the creation of a "Court of Patent Appeal" in which patent litigation involving serious technical questions would be conducted before a bench of scientific experts. The bill probably died in committee, for it has been lost sight of and forgotten. Recently, however, there has been a revival of the agitation under the leadership of E. P. THOMPSON, a New York patent attorney, and of LUDWIG GUTMANN, an electrical engineer of St. Louis. The aid of the technical press has been sought in furthering an intelligent discussion of the subject, and the *Electrical World and Engineer* has consented to receive correspondence on "Patent Law Reform" with the purpose of forwarding it to the Bureau of Commerce and Labor at Washington, or, if the correspondence is of sufficient volume, to use it as the basis of a memorial to Congress.

It will be generally conceded that reform

is needed in the patent law situation. As matters now stand, patent litigation is conducted in the United States courts before the regular judges, who, however able and impartial they may be in a legal sense, are not qualified by training or experience to give decisions in suits involving abstruse technical questions that would often puzzle the most expert engineer. It is not the intention of the agitators to override the existing courts. They suggest rather that the work of the courts be confined to questions of law, while the purely technical side of a dispute would be considered by an advisory board or lower court composed of men of reputation and thorough scientific training.

This, of course, is a mere outline of the plan of campaign, and those who are interested would further the cause by sending their views to the technical publication referred to at New York.



Needlessly Racing the Motor.

The breakdown of one of the finest racing cars at the recent Florida meeting suggested to an on-looker the thought, that, considering the abuse rather than the use of automobiles, it is a marvel of practical mechanics that their general reputation for reliability is so good to-day. Any car may fail from defective materials of construction, which may be employed unintentionally in its construction, no matter how careful the builder; for materials, especially the highest grades, have a knack of doing surprising things sometimes. But assuming the best—in all that the word signifies—in materials, they have been employed by the designer and constructor for use, not abuse.

The car referred to had been driven down to the start and was waiting to take its place at the line, with clutch open and the motor turning over idle. The driver, apparently in his anxiety to make sure that it functioned properly at even the highest speeds, pressed down the accelerator pedal at intervals, the powerful engine responding with a rapid-fire, ear-splitting roar. To paraphrase the famous remark of a French general: "It was beautiful, but it was not engineering." Once too often the accelerator was depressed and in an instant the motor was a wreck. Probably it had never occurred to the driver that the engine had been designed to do *useful work*, and that the factor of safety that would be sufficient to enable him to get under the weight and win a race was not sufficient to prevent disintegration when the potential energy of the machine was employed in that direction. Until the advent of the automobile it was an unwritten rule in engineering practice never to race an engine. The more powerful the motor the more necessary this precaution. As a general proposition the driver who treats his motor with consideration will get a return in kind even though he may not get any articulate acknowledgment.

The Important Albany Highway Convention.

How the New York State Supervisors Will Recommend the Expenditure of the \$50,000,000 for Good Roads,

The report of the executive committee of the New York State Supervisors' Seventh Annual Highway Convention, to be held in Albany, April 3 and 4, is strongly and concisely drawn, and places clearly in front of the people what work has been accomplished by the highway conventions in the past six years, and upon what lines the executive committee recommend action at the present session of the Legislature.

Briefly, the report recommends that such legislation should be secured, that when the \$50,000,000 is expended the state of New York will have built, in such counties as desire it, all or a part of a complete county system which shall communicate with the adjoining counties, so as to make a complete state system capable of developing farm values and making the inaccessible parts of the state accessible for commercial purposes.

To accomplish this the committee recommends legislation which will enable the comptroller to sell, from time to time, bonds which shall not at any one time exceed \$50,000,000, using the proceeds to build highways in the respective counties as soon as and whenever the counties and state engineer are ready to construct them.

To secure an equitable distribution and a complete state and county system the committee recommends that the counties shall file in Albany maps showing the roads in each town desired to be improved by the town boards in each county, which roads so designated by the town board and board of supervisors shall be deemed by them to be proper for the complete internal improvement of their town and county, and for which the town and county pay respectively 35 per cent. and 15 per cent. of the cost in their respective counties and towns.

These roads so designated for improvement may be improved by the state engineer on behalf of the state, which pays the other one-half of the cost of construction if the state engineer believes such road so to be improved would make a proper part of a county system, also a proper part of a state system, and provided the improvement approved of does not make an inequitable apportionment to that county over the improvements to be equitably apportioned to other counties of the state. This plan the committee is submitting to all supervisors and highway commissioners prior to the meeting in Albany, in order that it may be thoroughly understood, and approved or modified when the convention meets in April.

Road Work in Pennsylvania.

Since the Sproul-Roberts law went into effect in Pennsylvania about three years ago

more than 200 miles of public roads have been improved. At the first glance this may seem considerable, but, comparing it with the hundreds of miles of roads that cross-hatch this great commonwealth, it is not so great. But the encouraging fact remains that the work is going on intelligently, and every mile of good road built encourages the construction of more.

According to the state highway commission, Pennsylvania has 97,940 miles of public road. This is exclusive of roads which are used by the public but are privately owned. It is also exclusive of 1,101 miles of toll roads, which, however, in a sense are improved, but are not all well maintained.

The appropriation of \$6,500,000 made by the state in conformity with the Sproul-Roberts bill is to cover a period of six years, various sums being released each year. For this year \$1,250,000 is available and for 1907 and 1908 \$1,500,000 each is set aside for road improvement. As the county and township must furnish their quota of cash, one-eighth of the total amount in each case, the annual total is considerable. The present fiscal year ends May 1, 1906, and applications have been received from the various counties for more mileage than the available cash on hand to that date will construct, showing that the interest of the rural population has at last been awakened to the lasting and diversified benefits derived from improved highways. Of the counties in Pennsylvania only five have not applied for state aid in road building. They are Bedford, Juniata, Jefferson, Schuylkill and Lebanon. Chester probably leads in mileage of improved roads, but Montgomery and Bucks are not far behind.

Since January 1, as automobilists residing in the Keystone state are aware, the highway commissioners have had charge of the issuing of automobile licenses and tags, and this department has been more than busy. During January alone more than 4,000 licenses were issued. Under the present law the operator, and not the car, is licensed.

Highway Progress.

State Highway Commissioner Earle, of Michigan, is having prepared a large number of supplements for country newspapers giving the laws relating to the construction of roads by state aid and other information to which it is desired to give wide publicity. The commissioner has on hand applications for state aid for roads aggregating \$67,300. There is available for this purpose not more than \$70,000, in addition to the money received from automobile licenses.

The Government of the United States has

built highways in Cuba, in Porto Rico and the Philippine Islands, and Congress is even now preparing to appropriate money to blaze the highways and establish means of communication in Alaska. But the astonishing fact remains that the Government has taken no substantial part in building highways at home, and helping the people who sustain it and furnish it the very sinews of existence as a government, although it is not forbidden by constitutional limitation or sound public policy from engaging in such internal improvement.

The good roads reform has struck Ottawa county, Michigan, and especially the portion of it surrounding Holland. Farmers through the surrounding territory are greatly interested in the movement and meetings all over the county are in prospect. At a meeting at the Brinkman school, near Grafschap, President Anthony Rosbach, of the Ottawa County Rural Carriers' Association, described the condition of the rural highways and told how they might be improved at a small cost. The use of King's split log drag was recommended for improving the roads. One of these can be made by any handy farmer, as there is no patent on the simple but effective contrivance, and if used on the roads directly after a rain it will level up the roads, fill in the cuts and keep the highway in excellent condition. The drag is made by splitting lengthwise a log 9 feet long 6 inches in diameter, the two sections being held together by pins 30 inches long, which give it the appearance of a ladder. It is the intention of the rural carriers to keep up the interest in good roads, and a number of meetings will be held to develop further interest.

FROM NEW YORK TO MICHIGAN.

From New York City to Lawton, Mich., is a journey that was taken last fall by C. D. Van Riper, who was accompanied by his wife, and incidentally carried along a dog which took a keen interest in the trip from start to finish. The 1,500-mile journey, including stop-overs, was accomplished in seven days by the 12-horsepower Franklin, which once covered 158 miles on seven gallons of gasoline.

From New York to Albany the rain made matters decidedly uncomfortable, but the fairly good roads made traveling comparatively uneventful. But from Albany to Utica the highway was of a decidedly doubtful sort. There was a slight improvement between Utica and Syracuse, and from the latter city to Rochester the going could have been improved upon very perceptibly. As a welcome change came the good road from Rochester to Buffalo, which also continued and even improved to Erie, Pa. Thenceforth to Michigan the roads alternated from good to fair and back again.

Not a single accident marred the trip, nor did Mr. Van Riper frighten any horses, and even the farmers gave him a welcome that showed how thoroughly their antipathy to the automobile is losing ground.

New Decauville Establishment in New York.

THE automobile industry has brought about a paradoxical use of the word "plant," heretofore used synonymously with "factory," and generally understood to mean a building or buildings devoted to the manufacture of a finished or partially finished product. However, "plant" is the only possible designation of the up-to-date combined salesroom, offices, repair shop and garage recently occupied by the Decauville Automobile Company, at the corner of Fifty-sixth street and Broadway, New York city.

The rapid growth of this concern, formerly known as the Standard Automobile Company, necessitated a radical move if the demands of the future were to be met, and the magnificent new building, now practically finished, was planned to house the several departments of the business. In order that the facilities for handling a great number of cars on storage might be of the best, a location was chosen that is particularly favorable to the arrangement of the plant in separate departments under one roof. The company considered it a prime requisite that the site should provide a corner frontage on Broadway and one of the cross streets near Columbus Circle, in the leading retail automobile district of the Western Hemisphere. The plot so situated has a frontage of fifty feet on Broadway and a depth of sixty feet on Fifty-sixth street.

Directly in the rear, at right angles to the rear line of the lot, an adjoining lot was secured, which has a frontage of seventy-five feet each on Fifty-fifth and Fifty-sixth streets and a total depth of 200 feet, running entirely through the block and having

entrances to the garage and repair shop on both the north and south fronts.

Work on the construction of the buildings was begun about ten months ago and, in order that the company might take possession of the premises at the earliest possi-

larger plot, provision being made for the addition of one or more stories to the height of the larger building at any time in the future when the growth of the business of the company should demand more capacity in the departments devoted to storage and repairs.

With this in view, the construction decided upon was steel and concrete, the en-



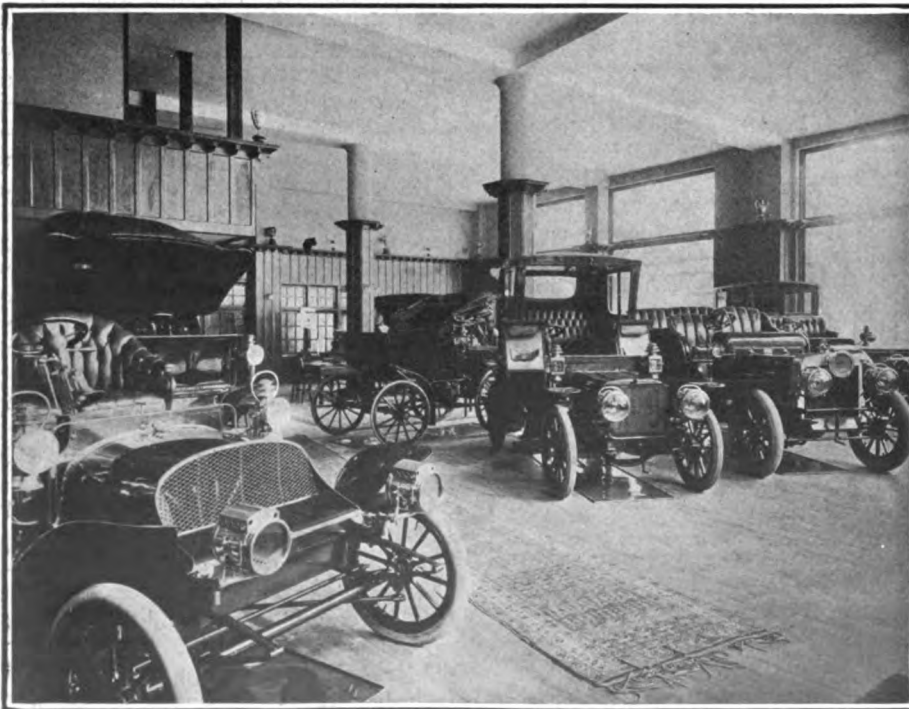
FRONT OF THE DECAUVILLE AUTOMOBILE COMPANY'S NEW SALESROOM AND OFFICES ON BROADWAY AND 56TH STREET, NEW YORK.

ble moment, it was decided to erect only a three-story building on the corner lot and a two-story and basement building on the

tire building being so designed that the added weight of several stories will by no means test the strength of the foundations, side walls and sustaining columns. The floors and walls of the main building are of concrete with suitable steel tie rods and other structural steel work as demanded in the most approved modern fire-proof practice, wood being used only for such minor purposes as absolutely necessary in the proper installation of machinery and benches.

The salesroom occupies nearly the entire ground floor of the three-story wing and is advantageously located for the display of the various cars handled by the company. In addition to the Decauville line, the C. G. & V., English Daimler and Franklin gasoline cars and the Babcock electric carriages are handled, giving the concern a wide representation in the field of pleasure vehicles. On the same floor and in a mezzanine gallery are located the offices for the use of the retail sales department. Access to the garage is by way of a door opening directly on the main floor of the larger building. The general and executive offices of the company are located above the salesroom, being reached by a passenger elevator and a fireproof stairway.

The executive offices are arranged en suite on the Fifty-sixth street and Broad-



INTERIOR OF SALESROOM ON GROUND FLOOR, SHOWING GALLERY (AT LEFT) TO OFFICES.

way fronts, and, while fitted up in the best of taste, are in no way pretentious. Separate offices are provided for each department, with a remarkably comprehensive equipment for the transaction of clerical work, filing of records and other details incidental to the management of the many branches of the company's business. At this writing the third floor of the corner wing is in the hands of the decorators and work is being pushed forward so that the entire available office capacity of this building may be put to use, to the relief of the somewhat congested condition of the floor now in service.

A basement extends under the two buildings, and is so divided that the main floor is unencumbered with such departments as can be advantageously located in the basement. The heating plant, consisting of a battery of two boilers with large coal bunkers, is located under the salesroom, and the floor under the main building is about equally divided between the washing and cleaning department and a large room for the care of electric vehicles, suitable charging panels, trucks for handling batteries and other appliances being installed for the up-keep of this type of car.



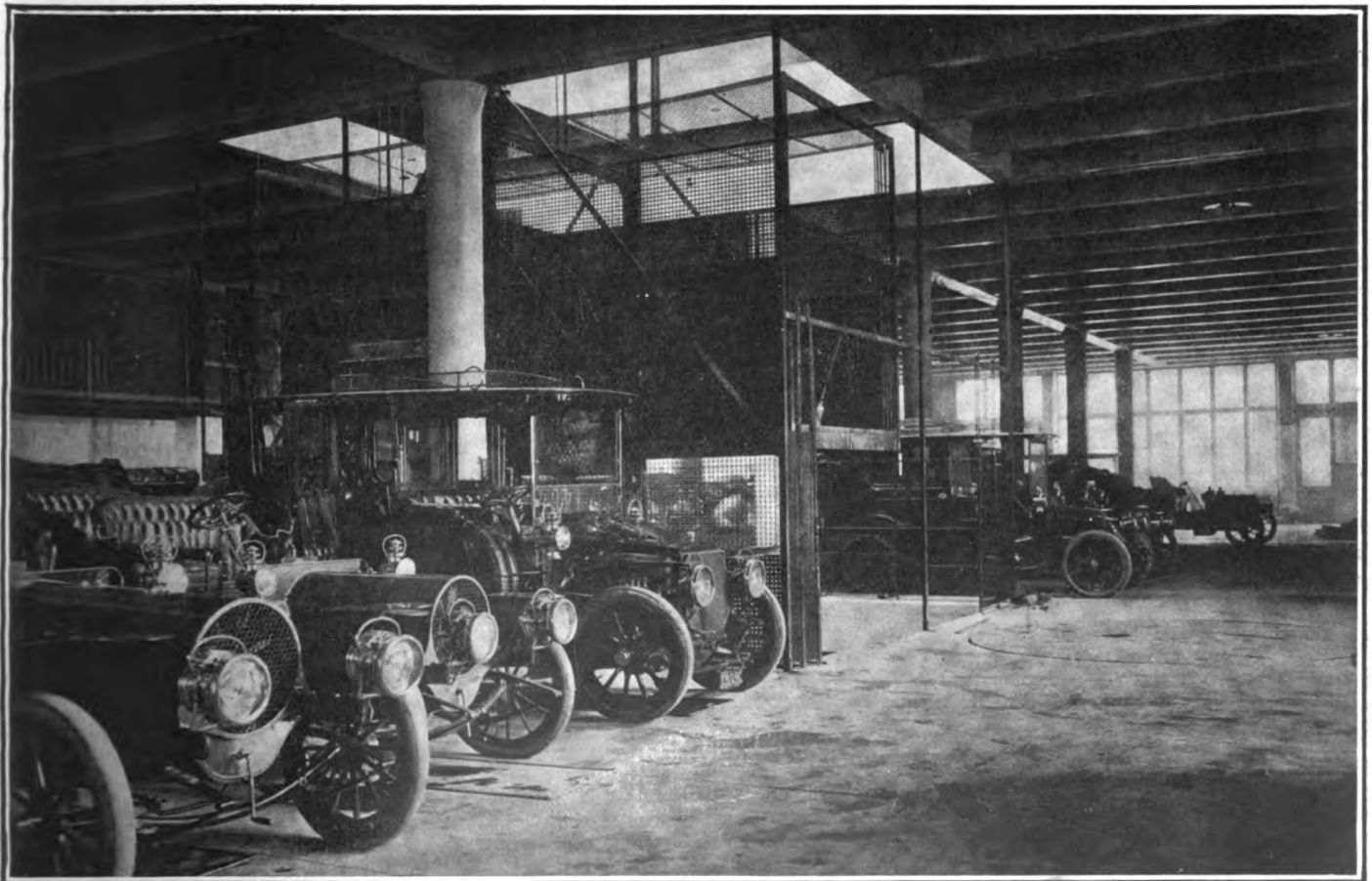
ONE END OF MACHINE SHOP IN REPAIR DEPARTMENT.

In the cleaning department the washing will be done on four large stands with ample light and convenient water connections

for quick and thorough work. The cars are carried to the basement floor by elevators, two of very large size being installed midway of the large building, with turntables at either side, affording ready access to each floor.

The available floor space of the garage has not been diminished by locating the locker department on the ground floor. The lockers have been placed on a gallery with communicating stairways at several points. There will be nearly 200 of these, all constructed of metal, each thirty inches deep and sixteen inches wide. The walls of the garage are covered with white glazed tiles, a part of the scheme to maintain as clean and light a garage as possible. Other appointments are in keeping with this idea and the company is directing special efforts to earn the reputation of maintaining the cleanest garage in the world.

The necessary supporting columns of the structure are nine in number, intersecting the short axis of the larger building so that two wide aisles are provided. Each aisle accommodates four rows of cars, and the handling of machines is as unobstructed as though no columns existed. The main entrance and exit is located on the Fifty-sixth street front, with emer-



INTERIOR OF GARAGE PROPER OF NEW DECAUVILLE ESTABLISHMENT, SHOWING TWIN FREIGHT ELEVATORS WITH TURNTABLE IN FRONT.

agency doors on Fifty-fifth street. A comprehensive checking system is maintained at this entrance, each car being checked on arrival or departure in such a way that a complete record of its movements is preserved in duplicate for the owner and the company.

The second floor, reached by four iron and steel stairways and the two large elevators, is divided into a number of departments, chief of which is the extensive repair shop, in which is installed a double line of the most approved machines for the repair or manufacture of any part of the mechanism of the up-to-date automobile. Adjacent to the machine shop is the forge and brazing rooms, each a closed apartment, absolutely fireproof, and cut off from all communication with the remainder of the building except by a single-entrance door.

On this floor is a large space set apart for the use of chauffeurs and owners who may wish to effect adjustments, repairs or replacements; and, with a view to affording the best possible facilities, the department is provided with ample light and sufficient bench room for the accommodation of a considerable number working at the same time. Just off this large room are shower baths and lavatories with lockers for the use of chauffeurs, similar accommodations for employees of the company being located near by.

A number of stockrooms, for machine tools and sundries and for car parts, are located on this floor in suitable proximity to the machine shop and communicating passageways. Access to each department of the building is facilitated by numerous all-metal stairways disposed at frequent intervals.

Midway of the length of the garage, on a piece of land twenty-five feet wide by

seventy feet deep, is the accessories department in a separate building that opens into the middle of the garage. At the rear of this building is a large checkroom for robes and bulky articles which cannot be put into lockers.

All gasoline and oils are stored in tanks set below the ground and filled from the outside of the building on the Fifty-fifth street front. Two rooms are located in one corner of the garage, one for gasoline and the other for oils. Each is fitted with registering pumps and the interior walls and floors are lined with white tiles. The gasoline is delivered to cars from a wheeled tank of fifty gallons' capacity, a measuring pump on the tank indicating the exact amount used. In the oilroom no less than six pumps are installed for various grades of lubricating oils and kerosene.

Garage Record System.

The large number of cars handled regularly in the big garages in New York City requires the keeping of a complete record of all work done on each car, and of the coming and going of each machine. While the systems differ somewhat in details, the result in all is practically the same, and the system in use at the new Smith & Mabley establishment on Broadway will serve as an excellent example. Garage keepers in smaller cities may gather some useful ideas from it.

For every car regularly kept in "live" storage a record card like that reproduced herewith is filled out each week, the date, names of owner, chauffeur and car and the registered number being filled in at the beginning of the garage week, which is on Friday. Every time the car leaves and returns to the garage during the succeeding

seven days the time is recorded in the proper blank space, provision being made on the card for three departures and re-

SMITH & MABLEY INC.						
GARAGE						
Form 514 NEW YORK CITY						
WEEK ENDING		190...				
OWNER						
CHAUFFEUR						
CAR						
REG. NO.						
DAY	OUT	1	2	3	4	5
F	OUT	IN	OUT	IN	OUT	IN
S						
S						
M						
T						
W						
T						

Each automobile is checked at door of recording. Arranging card to be made to have duplicate of this card mailed weekly.

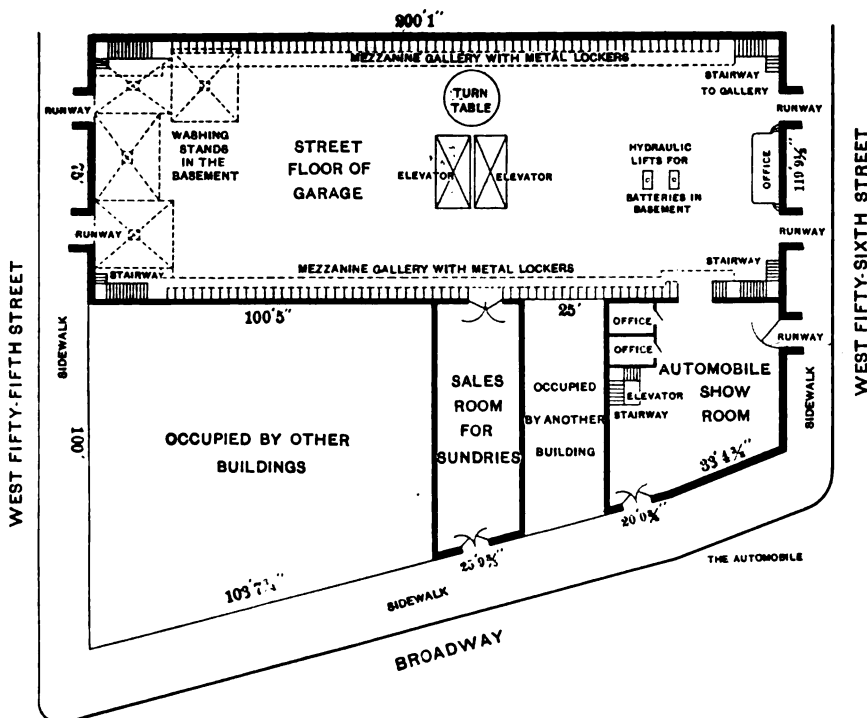
CARD FOR RECORDING ARRIVAL AND DEPARTURE OF CAR

turns each day. As the car goes out and comes in it is checked and the time is registered at the door by a recording clock. The record card is kept in the garage office until the end of the week, when a duplicate is mailed to the owner of the car if desired and the original is filed away for preservation.

There is also a special card for use in the washing department. As soon as a car comes into the garage one of these tags is tied to the steering wheel, with the name of the owner written in the second line; the robes and automobile clothing left in the car are placed in a locker under key and the number of the locker is entered in the first line on the tag. In the upper right corner is written the hour at which the car is to be ready for use again, and in the lower left corner is written the date.

Every workman in the establishment is known by a number, and the number of each man who assists in washing and polishing or in cleaning the machinery is entered on the tag, which is then signed by the man who inspects the work and checks the car as ready for the road once more.

A very similar record system prevails in the repair shop, so that the management has a permanent complete record of every man who touched a tool to the car, the time spent on the job and the nature of the work.



PLAN OF NEW DECAUVILLE GARAGE, SHOWING MAIN FLOOR ARRANGEMENT, AND WASHING STANDS AND BATTERY LIFTS IN BASEMENT.

THE GROWING GARAGE LIST.

A first-class garage and salesroom, 27 by 90 feet, will be opened about March 15 in Pottstown, Pa., at 18 South Hanover Street, by the Pottstown Automobile Exchange. A full stock of automobile sundries and supplies will be carried.

Graham & Goodman, Inc., have just completed and occupied a new fireproof garage at 51-55 West Ninety-third street, New York City, convenient to subway, elevated and surface lines of transportation. The garage contains every accessory for the convenience of car owners and their servants and chauffeurs.

Contract for the construction of a two-story brick building, 25 by 75 feet, on Green avenue, Altoona, Pa., has been let by Messrs. R. A. Rohrer and G. C. Epplenman. The building is to be occupied in about two months by the Altoona Motor Car Co., which will conduct a garage and repair business. Automobile supplies and sundries of all kinds will be carried in stock, and the establishment will be equipped in the most up-to-date manner for the convenience of patrons and to facilitate work.

W. E. Weaver, agent for the Maxwell cars in Portsmouth, N. H., is about to open a garage near the corner of Fleet and Congress streets, that city. The interior of the building, which was formerly a carriage house attached to the livery stable adjoining, has undergone extensive alterations, involving considerable outlay. The garage will afford accommodations for from thirty to forty automobiles, and will have up-to-date facilities for stabling, repairing, selling and renting cars. The building has been leased for a term of five years.

One of the most complete garages in Michigan was recently completed in Bay City for F. H. Fenner, who is local agent for the Winton and Cadillac. The garage was designed after study of many garages throughout the country. Among its special features are a very wide entrance and fire-proof construction, the material being steel, cement, brick and concrete for floors. There are 7,500 square feet of floor space, affording storage for fifty cars.

At Marysville, Cal., one of the best equipped garages in the state north of San Francisco, has just been completed by W. B. Grow. It is 60 by 82 feet in size and is of fire-proof construction. Mr. Grow is agent for Olds and Winton cars and carries a line of sundries and supplies in addition to conducting a repair shop.

In Seabreeze, Florida, on the boulevard leading from Daytona to the Ormond-Daytona Beach, Messrs. Egan & Grinnell conduct what they assert is the largest garage in the state of Florida and the best equipped repair shop south of New York. This shop has lathes capable of boring cylinders and taking crankshafts for straightening, a 16-inch stroke shaper, milling machines, a large drill press and several smaller drills, emery grinders, forges, anvils, vulcanizers

and other equipment. A large stock of accessories and supplies is carried. The garage is 150 by 75 feet in size and has private stalls 12 by 20 feet, entirely enclosed and fitted with work bench equipped with a few common tools. There are facilities for charging electric vehicles, and in connection with the garage the proprietors maintain a small hotel with seventy-five rooms and accommodations for chauffeurs. On the Halifax river near by they also maintain a boat-house equipped for the care and repair of gasoline launches.

BALTIMORE TRADE DOINGS.

Baltimore, Md., Feb. 26.—The city undoubtedly has the automobile fever in a pronounced form. A couple of months ago there were only fourteen cars represented here, and now there are over thirty, with more coming.

The Mt. Royal Garage, Mt. Royal and Maryland avenues, Baltimore, built by the George A. Fuller Company for the Motor Car Company, has recently been opened. The building will be used as a salesroom and garage and will be kept open day and night. The company claims that it covers more ground floor space than any other establishment of the kind in the country, and its equipment is thorough and up-to-date in every particular. The structure is fire-proof—steel construction being used throughout, and there are few posts. All cars are stored on the first floor and a numbered space is allotted to each. A specially designed floor arrangement makes possible the washing of a car where it stands. A repair shop is located in the rear of the building. There are waiting and reading rooms on the second floor, and quarters have been provided for chauffeurs, so that a driver may be reached for immediate service.

The Members of the Motor Car Company are Howard W. Gill and Arthur Stanley Zell, two well-known young men of Baltimore. They are the local agents for the Peerless, Thomas, Stevens-Duryea, Stanley steamer, and Baker electric. They have a branch in Washington, where they handle the Peerless and the Stevens. Prior to moving into their new home they occupied a stone church on Park avenue and Biddle street. A feature of the new building is the electric lighting on the exterior. Incandescent lamps are strung from corner to corner of the front and in the center arch over the main entrance.

The Motor Carriage Company, a new concern, has been incorporated in Baltimore, the incorporators being G. F. Bucholz, James Caldwell, W. C. Hood, and Messrs. Benzinger and Collier. The capital will be \$10,000, and the company will represent the Winton, and the Pope-Hartford, and Pope-Tribune lines.

CHICAGO TRADE NOTES.

Chicago, March 5.—Charles A. Coey had a number of automobile livermen at luncheon at the Chicago Automobile Club last Thursday. The subject discussed was the organization of allied interests among those who rent machines.

The Motor Car Company, 1427 Michigan avenue, has closed a deal with R. L. Kingston, the United States representative of the Harburg Tire Company, to act as Chicago representatives of that firm.

Fred P. Brand, manager of the local Aperson branch, has resigned to accept the position of assistant general sales manager and traveling representative of the Autocar Company.

PHILADELPHIA TRADE MATTERS.

Philadelphia, March 5.—The result of the show will be the addition to the membership of the Philadelphia Automobile Trade Association of almost every dealer and repairman not already a member.

The Knox Automobile Co., of 202 North Broad street, Philadelphia, has secured the agency for the Blakeslee electric for eastern Pennsylvania and southern New Jersey. A. F. Clark, the electrical man of the Knox concern, has been building electric vehicles for years, having designed and constructed one of the first successful commercial wagons of that type ever operated in the East, some of which are still in service. The Knox concern is also representing the Logan gasolines, and is about to demonstrate for a big department store, which proposes to do away with its horse delivery if the test is successful.

Besides the Rainier branch soon to be located in Philadelphia, the Leon Bollee car is soon to be represented there by an agent.

John N. Reeve, a Philadelphian, has secured the Maxwell agency for Cape May and Cumberland counties, N. J., and has started the Wildwood Auto Co., at Wildwood, N. J., with a sub-agency at Millville in charge of Harry Murphy. He will run an automobile line to Cape May during the months of June, July and August.

The Studebaker exhibit was installed in high-priced quarters during the show. It appears that Titman, Leeds & Co., the new local agents, were appointed after the former representatives, the La Roche Automobile Company, had bought and paid for two \$200 spaces. The week before the show Mr. La Roche was offered \$400 each for the two spaces by an outside concern, but his loyalty to the Studebaker prevailed, and he disposed of his holdings to the new agents for a bonus of \$350 over and above the original cost.

WILL DEVELOP HOME TRADE.

Indianapolis, March 5.—Local manufacturers are expecting to get their full share of local business this year if every possible effort will do it. Hitherto they have not been as well represented as they are this year, and for that reason out-of-town makers have secured a good share of the business. A list of cars owned in the city has just been compiled from the 1905 license list, and of 352 cars registered it is shown that 124 of them are machines made in this city. This cannot be taken as accurate, however, as it is estimated that fully 200 cars were not registered in Indianapolis last year.

The 1906 license tags are now ready, but as yet there has been little demand for them. Only about twelve owners have taken out the tags since January 1, but the police show no desire to compel owners to obtain them.

The Buick line will be carried by the Federal Motor Car Company in Indianapolis, that company having recently obtained the agency for the cars. In addition to Buick, the company will carry a line of Stevens-Duryea cars.

F. H. Wheeler, of Indianapolis, A. E. Spiegel, of Shelbyville, and W. E. Morris, of Liberty, have purchased Stoddard-Dayton cars through the Fisher Automobile Company. Indiana agents for that line.

The New York Court of Appeals at Albany has confirmed the decision of the Court of Special Sessions of New York City against E. R. Thomas, the prominent automobilist, who was fined \$25 for violating the speed ordinance last spring. The case attracted much interest among automobilists, Mr. Thomas claiming that his arrest and conviction were unjustified.

News and Trade Miscellany.

One of the most enthusiastic motor car drivers of Indianapolis, Ind., is E. B. Hanna, an engineer on the New York Central lines, Cleveland division. Mr. Hanna is engineer on a fast passenger train, and recently established a new record for the division, running thirty miles in twenty-seven minutes with a small-type engine that hitherto has not been noted for unusual speed. For two seasons Mr. Hanna has driven a Rambler car and after making a long, hard run with his train, frequently spends several hours in his automobile. Excepting in case of tire troubles, he repairs his car himself and thoroughly understands its machinery, just as he does the machinery of the engines he has run for nearly thirty years.

An Indiana town, Napanee, lays claim to owning more automobiles in proportion to its population than does any other town in the state. With a population of 2,500, it is said the number of automobiles owned will average one for every 100 population. The town is located in a wealthy farming section and is one of the most up-to-date little towns in Indiana.

The Cleveland Cycle & Auto Co., of Buffalo, N. Y., has filed notice in the office of the county clerk that it has decided to increase its capital stock from \$2,500 to \$5,000.

One of the largest individual shipments of automobiles on record was a solid train of seventeen cars dispatched from the Kenosha, Wis., factory of Thos. B. Jeffery & Co., on February 25, to the San Francisco agent of the company. The shipment contains fifty-two Rambler cars of the surrey Type 1 model, fourteen surreys Type 3, and one surrey Type 2. The shipment is not to be broken up at San Francisco and parceled out to sub-agencies throughout the Pacific Coast, but is for direct disposition in 'Frisco. Freight charges alone on this shipment aggregate \$6,630.

Although a large addition to its plant was but recently completed and occupied, the Timken Roller Bearing Axle Co., of Akron, O., finds it necessary to increase its facilities, and to this end has just closed contracts for buildings and machinery that will more than double the present capacity. The company has secured the services of H. W. Alden, formerly of the Electric Vehicle Co., and late of the Pope Mfg. Co., where he was in charge of the commercial truck department. Mr. Alden brings to the Timken engineering department a wide experience.

A school for practical instruction in the use and care of automobiles and in the theory and practice of design, construction and operation, has been opened in Portland, Me., by the H. J. Willard Co., Inc. The company, which is also state agent for the Packard, Peerless, Franklin, Winton, Cadillac and Buick cars, reports that it is meeting with success in its automobile school undertaking.

The factory of the Gearless Transmission Company has been removed from Glens Falls, N. Y., to Rochester, N. Y., where the company has better manufacturing facilities.

W. W. Burke, manager of the New York branch of the Electric Vehicle Co., said recently that one of the results of the New York show appeared to be a sudden increase of interest in the subject of commercial vehicles. He said that he had already received a number of orders and expected to close within a few days several important deals in trucks and delivery wagons as a direct result of the company's exhibit at

Madison Square Garden. Mr. Burke also remarked upon the growing tendency of New Yorkers who owned gasoline cars to also keep electric broughams or landaulets for city use. While a great many gasoline cars with closed bodies are in use for what might be strictly called town carriage service, the special advantages of electrics for this use is receiving increased recognition each season.

Souvenir postal cards, showing Dr. H. E. Thomas's Locomobile in the last Vanderbilt cup race, with Joseph Tracy at the wheel, will be mailed to any address in sets of one dozen for 12 cents in postage stamps, by the Locomobile Company of America, Bridgeport, Conn. The views are similar to the large lithographed colored posters, 20 by 24 inches, suitable for framing, which the company offers to mail for 10 cents in stamps. All the pictures on the postal cards are from photographs selected to show as many points of interest around the racecourse as possible.

Management of the National Sales Corporation, 256 Broadway, New York, passed into the hands of Joseph Grossman on February 26, succeeding E. J. Kuegeman, who has held that position during the past few months. Mr. Grossman has been connected with the Continental Caoutchouc Co. during the past fifteen months in the capacity of advertising manager and purchasing agent. The Sales company is exclusive selling agent for Soot-Proof plugs, Connecticut coils, plug switches and meters, Dodge lubricators and timers and Geecce batteries.

Among the numerous tests to which the Wayne car will be put this spring are the six-day non-stop run in the streets of New York, to be started as soon as the weather clears, the sprint races at Atlantic City during Easter week, and the Wilkesbarre hill climb in April, to be managed by W. J. Morgan. The six-day non-stop run will be the first ever engineered in New York City on the streets and will be run to conform with the rules of the city as regards speed.

President H. S. Firestone entertained thirty-seven employees of the Firestone Tire & Rubber Co., of Akron, O., at a banquet in the Hollenden Hotel, Cleveland, on February 22. Tables and walls were appropriately decorated to commemorate Washington's birthday. In one of the toasts President Firestone said: "It is not hard for me to understand, in looking over this assemblage, why more than 85 per cent. of all the commercial automobiles operated in America are equipped with Firestone tires." After the dinner the entire party visited the automobile show in Central Armory.

Benjamin Briscoe, president of the Maxwell-Briscoe Motor Company, of Tarrytown, N. Y., has come forward with a plan for running the Glidden tour, or at least a portion of it, from Buffalo to Detroit by way of Canada. Mr. Briscoe says that if the tour must go through Canada the roads in the section he has indicated are much better than those in the route projected tentatively by the A. A. A. touring committee last fall from Buffalo to Montreal.

As proof of the efficiency and non-sooting qualities of its Comet spark plugs, the Oakes & Dow Co., 40 Sudbury street, Boston, has issued a circular calling attention to the fact that the Haynes car used in the last Vanderbilt Cup race, the National car that broke the 24-hour record on the track at Indianapolis in November, and the Moline car that won first prize in the Denver economy and endurance test in September, were each fitted

with a set of four Comet plugs. It will be remembered that the performances of all these cars were remarkable for their uniformity as well as for the speed maintained.

The Aerocar Company of New York has been formed to handle the Aerocars in that city. A fine large showroom has been opened at Seventy-third street and Broadway, with a big frontage on both streets. A large electric sign visible for a mile each way gives extra emphasis to the location, which is in the great automobile row of the metropolis.

Fifty-eight per cent. of the wheels in the recent Berlin Automobile Show were fitted with Continental tires, according to figures compiled for the Continental Caoutchouc Company. Out of a total of 1,469 wheels 862 were fitted with Continentals.

Manager Archer, of Archer & Co., New York agents for the Hotchkiss cars, made by the famous gun makers of France, has already delivered fifteen cars in the Eastern market, and so steady has been the demand that he has secured forty more cars through cabling to agents all over Europe.

The English Daimler car is being used for a great many long winter trips by Messrs. Demar & Hardy, of the English Daimler Co., having traveled to Philadelphia and Boston frequently this winter. The Daimler has gained popularity in America already, having been placed with a number of prominent people.

A large shipment of Harburg tires is expected April 1, when the new Harburg tire depot, on West Fifty-eighth street, near Broadway, New York, will be open and ready for business. Manager Kingston has secured a number of orders, and, although without stock for a short time, is placing orders for future delivery.

Many representative automobile dealers throughout the United States have decided to handle the Pope-Waverley electrics for 1906, for the reason that this line is particularly strong for the coming season, embracing several new models and showing a total of more than fifteen distinct styles, including runabouts, station wagons, surreys, chelseas, stanhopes, light delivery wagons and trucks of various capacity.

At a meeting of the stockholders of the Salisbury Wheel & Mfg. Co., of Jamestown, N. Y., held February 20, it was voted to increase the capital stock from \$50,000 to \$100,000. A large addition to the factory will be built the coming spring and more machinery added. The factory has been running twenty-two hours a day for the past three months and will be obliged to continue at this rate until July 1, at least, to complete orders on hand.

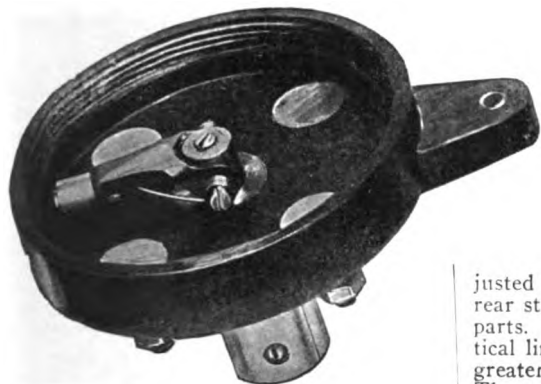
The Frevert Machinery Co. has opened a salesroom and offices at 18 Dey street, New York City, where it carries a complete line of new and second-hand metal-working tools and machinery of every description. It is also manufacturing a line of newly designed hand-power traveling cranes, trolleys, hoists and overhead trucks, which combine many improvements and new features. H. F. Frevert, the principal of the company, has had a wide experience in the machine tool business.

W. W. Taxis, formerly manager of the Philadelphia branch of the Ford Motor Company, has established an agency for the sale of automobile parts in the Odd Fellows' Temple, Broad and Cherry streets.

In a description of the Kilgore shock eliminator recently published in these pages, the statement was made that the "cushions" were sufficiently lubricated for 1,000 miles' driving, whereas this should have read 10,000 miles. The misstatement was caused by a typographical error.

INFORMATION FOR BUYERS.

DODGE TIMER.—A timer has been placed on the market by the Dodge Lubricator Company, 36 Columbus avenue, Boston, Mass., with a view of meeting the demand for a simple instrument made of the best materials throughout. The Dodge positive



DODGE POSITIVE TIMER, SHOWING ROTATING ARM AND CONTACT PLATES.

timer, as it is called, consists of a fiber shell, containing the contacts, and a shaft and arm rotating in the shell. The shaft runs in an accurately finished phosphor bronze bearing. The arm is pivoted to the end of the shaft inside the shell so that it can move up and down with relation to the contact points in the shell; a hardened steel roller running on a hardened steel pin on the end of the arm makes the contacts as it sweeps around, being pressed against the contact points by a spring of adjustable tension. As the roller is of the same diameter from end to end, and rolls on a path which makes it necessary for the outer end of the roller to travel a greater distance each time the shaft revolves than the inner end, there is necessarily a small amount of slipping or "wiping" which keeps the surfaces clean and insures good electrical contact. The manufacturers state that the fiber of which the case or shell is made is a special quality which will withstand 500 volts per 1-8 inch of thickness and will stand a heat of 350 to 400 degrees. The cover is of the same fiber as the shell and screws in place.

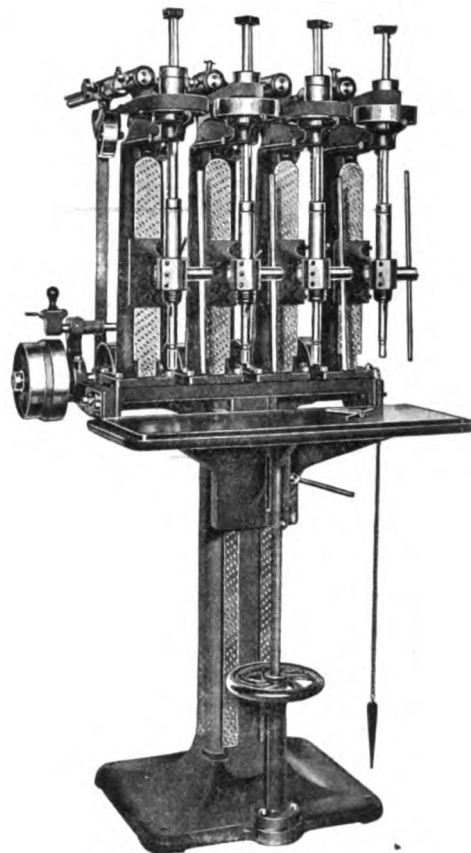
STEERING KNUCKLES AND AXLES.—The Diamond Chain & Mfg. Co., of Indianapolis, has decided to extend its business in the direction of making automobile parts and automatic machinery. A very large

machine department will permit the company to take on a few staples, as well as to manufacture automobile parts from individual specifications. Exclusive selling arrangements have been made with Hayden Eames, Cleveland, O., to market this part of the Diamond product. The first staple the Diamond company offers is the Diamond I-beam axle and steering knuckle, made under the Lindsay patents. The I-beam of special section is rolled straight from one piece of stock, in either 50-carbon stock or chrome nickel steel, eliminating welds and brazed joints. The forgings of yokes and spindle are simple and the factor of safety is large. Steering arms can be ad-

justed to suit any desired coupling—front or rear steerer or right or left—with the same parts. Yoke bearings hold the wheel in vertical line, and the T-shaped spindle gives a greater bearing surface than other methods. The spring seat is adjustable to any desired position; is strong, rigid, and will not flatten from action of the spring. The entire axle permits of lighter construction and has been designed for safety, strength and long life. It is adapted for cars of light weight, and is particularly recommended for touring cars and trucks. The axles will be equipped with hubs of special design, fitted with ball or roller bearings. The Diamond Chain Company, through Hayden Eames, is also prepared to make machine parts on contract.

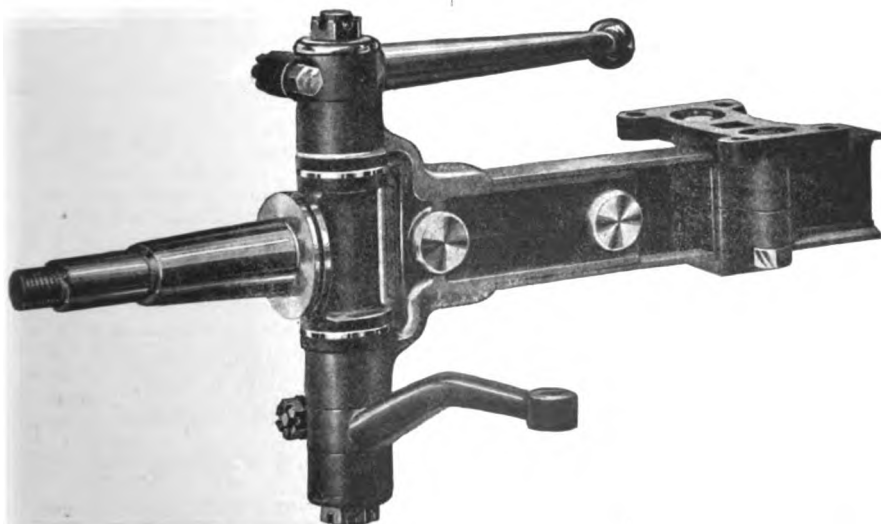
DRILL PRESSES.—The advent of the automobile may be said truthfully to be one of the greatest factors in bringing about the remarkable advance in machine tool construction and development that has been going on for the past decade. As one instance of this growth may be cited the sensitive drill press. For more than twenty-five years makers of this type of machine have been making practically the same type of machine. The new Henry & Wright ball-bearing drill, which was first placed on the market two years ago, showed such decided advantages that it met with immediate favor. The makers, the Henry & Wright Manufacturing Company, 115-133 Sheldon street, Hartford, Conn., claim exceptional advantages for their machine and assert that these have been proved and attested by prominent manufacturers in all parts of the world. Among the causes contributing to the remarkable performances of these drills

are the following: Ball bearings of accurate construction have been introduced throughout the machine, hence the friction has been reduced to a minimum; the new idler system, by which four speeds can be obtained with two-step pulleys and one continuous cemented belt always kept at proper tension as against three speeds, with three



HENRY & WRIGHT SENSITIVE DRILL.

and four step pulleys and two laced belts requiring continuous relacing and attention; new spindle drive, new pinion handle and new, compact and stiff general construction. The illustration shows the 1906 Model A drill, which is the same as the Plain machine in every way except that it is equipped with a hand screw table-raising mechanism.

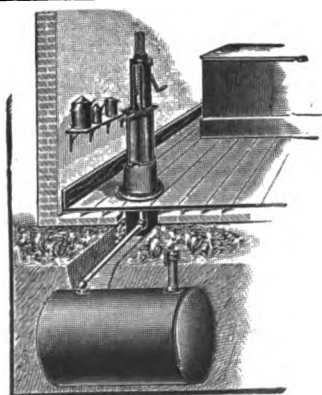


DIAMOND-LINSLEY I-BEAM ROLLED FRONT AXLE AND T-SHAPED STEERING KNUCKLE.

INDEX TO ADVERTISERS

Acetylene Gas Illuminating Co.....	29
Acme Motor Car Co.....	81
Add-Wear Tire Sleeve Co.....	61
Aerocar Co.....	110
Am. Anti-Puncture Tire & Auto Co.....	42
American Coil Co.....	29
American Generator Co.....	37
American Lubricator Co.....	31
American Machine Mfg. Co.....	31
American Shock Absorber Co.....	38
American Veneer Co.....	46
Anderson & Sons Co.....	31
Archer & Co.....	30
Ashton Valve Co.....	30
Aster Co., L.....	41
Atwood Mfg. Co.....	29
Auburn Automobile Co.....	106
Auto-Car Equipment Co.....	96
Auto Pump Co.....	31
Auto Top and Equipment Co.....	30
Automobile Blue Book.....	80
Automobile Equipment Co.....	46
Automobile Supply Co.....	28
Badger Brass Mfg. Co.....	41
Bailey & Co., C. J.....	63
Baker Motor Vehicle Co.....	112

Baldwin Chain Mfg. Co.	31	Graham Cycle Co., E.	30	New York Sporting Goods Co.	99
Ball-Fintze Co.	40	Gramlich Chemical Co.	27	New York & New Jersey Lubricant Co.	29
Barr, H. G.	55	Gray Hawley Mfg. Co.	27	Nicholsberg Mfg. Co., H.	46
Beaman & Smith Co.	57	Grout Bros. Auto Co.	124 and Cover	No-Ko-Rode	96
Berkshire Auto Co.	103	Ham Mfg. Co.	48	Nordyke & Marmon Co.	118
Beverly Mfg. Co.	31	Hardy Co., The R. E.	28	Normandie Hotel	52
Bicycle Step Ladder Co.	88	Harris Oil Co., A. W.	41	Norton Grinding Machine Co.	56
Blakiston's Son & Co., P.	89	Harrison Wagon Co.	126	Nuttall Co., R. D.	31
Boker & Co., H.	29	Hartford Rubber Works.	65	Ofeldt & Sons.	27
Borbein & Co., H. F.	33	Hartford Suspension Co.	27	Olds Motor Works.	125
Boston Mechanical Co.	86	Hatcher Auto Parts Co.	101	Pacific Tucking & Mfg. Co.	35
Bowser & Co., S. F.	45	Havemeyer Oil Co.	28	Packard Motor Car Co.	Cover
Brennan Motor Co.	46	Hawkins Mfg. Co.	35	Parish & Bingham Co.	31
Briscoe Mfg. Co.	31	Haynes Automobile Co.	110	Pedersen, J. T.	28
Brown, R. E.	34	Healy Leather Tire Co.	32	Peerless Motor Car Co.	123
Brown Talbot Machine Co.	32	Heinze Electric Co.	48	Pennsylvania Rubber Co.	65
Brown & Co., S. N.	30	Henry, Chester C.	106	Pigot, Sayre & Co.	85
Brownell-Trebert Co.	47	Henry & Wright Mfg. Co.	54	Pioneer Brass Works.	31
Baush Machine Tool Co.	59	Hicks Speed Indicator Co.	40	Pneumatic Tire Protector Co.	32
Buckeye Mfg. Co.	114	Hill-Clarke & Co.	54	Pope Motor Car Co.	108
Bullard Automatic Wrench Co.	Cover	Hine-Watt Mfg. Co.	40	Post & Lester Co., 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78 and	79
Buob & Scheu.	30	Hisey Wolf Machine Co.	57	Potter & Johnson Machine Co.	55
Burgin Bros.	29	Hoffman, George W.	29	Prest-o-Lite Co.	99
Burlington Railway.	39	Holley Bros. Co.	98	Railway Appliances Co.	52
Byrne-Kingston Co.	53	Hopson & Chapin Mfg. Co., The.	31	Raines & Co.	29
Cadillac Motor Car Co.	116	Hotchkiss, P. M.	36	Rainier Co., The.	42
Capitol Foundry Co.	31	Humphreys, J.	46	Rapid Motor Vehicle Co.	38
Carbondale Chemical Co.	28	Hydraulic Oil Storage & Distributing Co.	97	Remy Electric Co.	30
Carr, S. F.	49	Imperial Brass Mfg. Co.	37	Rex Imperial Leather Co.	101
Champion Co., Albert.	28	Induction Coil Co.	49	Richardson Engineering Co.	30
Champion Mfg. Co.	28	Iroquois Motor Car Co.	107	Robert Instrument Co.	50
Chelsea Clock Co.	67	Jacobs Mfg. Co.	58	Rock Island Battery Co.	49
Cleveland Motor Car Co.	109	Janney, Steinmetz & Co.	31	Rollins Mfg. Co.	44
Collins & Sons, G. A.	30	Jeffery & Co., Thomas B.	105	Royal Battery Co.	27
Columbia Lubricants Co.	34	Jersey Brake Co.	35	Royal Equipment Co.	108
Connecticut Tel. & Electric Co.	100	Jones Speedometer.	32	Royal Motor Car Co.	91
Continental Caoutchouc Co.	62	Kinsey Mfg. Co.	31	Rubay, Leon.	37-48
Continental Motor Mfg. Co.	35	Kirkman Motor Mfg. Co.	46	Samson Leather Tire Co.	64
Coops Co., C. W.	29	Knox Automobile Co.	114	Echug Electric Co.	27
Corbin Motor Vehicle Co.	119	Landis Tool Co.	56	Scoville & Peck Co.	50
Covert Mfg. Co.	29	Lipman, C. E.	31	Seldner-Miner Electric Co.	27
Crawford Automobile Co.	106	Lobee Pump Co.	35	Shaw, Ora D.	30
Cullman Wheel Co.	33	Locke & Co.	87	Shawver Co.	28
Cushing, J. M.	40	Locomobile Co. of America, The.	107	Sheddan Mfg. Co.	43
Dayton Electrical Mfg. Co.	48	Logan Construction Co.	30	Sibley & Pittman.	33
Decauville Auto Co.	84	London Auto Supply Co.	59	Sintz, Guy L.	47
Deere-Clark Motor Co.	40	Long-Turney Mfg. Co.	47	Smith Auto Co.	108
Diamond Chain & Mfg. Co.	29	Loring, E. J.	29	Smith Co., A. O.	45
Diamond Rubber Co.	62	Lozier Motor Co.	49	Smith Mfg. Co., R. H.	94
Dietz, R. E.	41	Manhattan Lamp Works.	30	Smith & Co., D. B.	28
Diezemann Shock Absorber.	45	Manning Mfg. Co.	112	Smith & Mabley.	127
Dixon Crucible Co., Joseph.	39	Matheson Motor Car Co.	111	Solderene Co.	28
Dorris Motor Car Co.	106	Maxwell-Briscoe Motor Co.	29	Speed Changing Pulley Co.	39
Douglass Andrews Co.	44	McCord Mfg. Co.	31	Spicer Universal Joint Mfg. Co.	28
Dover Stamping & Mfg. Co.	28	McDonald, Wessels & Ames Co.	29	Spittdorf, C. F.	35
Dow Portable Electric Co.	38	Mendenhall, C. S.	30	Sprague Umbrella Co.	34
Duff Mfg. Co.	59	Merritt Co.	28	Sprague Hat & Cap Co.	57
Duplex Coll Co.	37	Miami Pattern Works.	64	Sprague Machine Tool Co.	30
Duquesne Construction Co.	30	Michelin Products Selling Co.	30	Sprague Metal Body Co.	37
E. H. V. Co., The.	116	Middletown Auto Body Co.	31	Sprague Moulding Works.	33
Eastern Carbon Works.	40	Midgley Mfg. Co.	43	St. Louis Motor Car Co.	47
Eclipse Buggy Co.	30	Miller, Charles E.	47	Stachl & Co., L. E.	31
Edmunds & Jones Mfg. Co.	29	Milwaukee Auto Engine & Supply Co.	31	Standard Foundry Co.	100
Elbridge Electrical Mfg. Co.	43	Milwaukee Steel Foundry Co.	51	Stanley, John T.	47
Eldredge Electric Mfg. Co.	28	Mitchell Motor Car Co.	110	Stearns, F. B.	31
Electric Rubber Mfg. Co.	33	Moline Automobile Co.	104	Steel Ball Co.	113
Electric Vehicle Co.	117	Monon Railway.	30	Stevens Arms & Tool Co.	34
Elmore Mfg. Co.	115	Moon Motor Car Co.	63	Stitch-In-Time Vulcanizer Co.	32
English Dalmier Co.	106	Morgan, B.	29	Stolp Mfg. Co.	28
English & Mersick Co.	Cover	Morgan & Wright.	107	Stone & Downer Co.	33
Erie Railway.	52	Mosler & Co., A. R.	111	Streit Machine Co., A.	33
Excelsior Supply Co.	28	Moss Photo Engraving Co.	38	Supplementary Spiral Spring Co.	44
Fairmount Engineering Works.	28	Motor Car Co.	36	Swinehart Clincher Tire & Rubber Co.	61
Fitchburg Machine Tool Co.	55	Motor Car Equipment Co.	39	Teel Mfg. Co.	113
Ford Motor Co.	30	Motor & Mfg. Works Co.	92	Thomas Motor Co., E. R.	88-89
Franklin Mfg. Co., H. H.	120-121	Motz Clincher Tire & Rubber Co.	30	Times Square Auto Co.	97
Franklin Portable Crane & Hoist Co.	57	Mutty Co., L. J.	44	Timken Roller Bearing Axle Co.	43
G & J Tire Co.	66 and Cover	Myers-Dayton Top Co.	42	Trebert Gas Engine Co.	29
Gabriel Horn Mfg. Co.	99-52	National Battery Co.	50	Tritt Electric Co.	28
Garage Equipment Co.	28	National Brake & Clutch Co.	115	Tucker, C. F.	29
Garford Co., The.	35	National India Rubber Co.	24	Ultra Pump & Power Co.	32
Gearless Transmission Co.	60	National Motor Vehicle Co.	29	Uncas Specialty Co.	42
Geometric Tool Co.	57	National Tank Co.	39	Veeder Mfg. Co.	27
Gilbert Mfg. Co.	82-83	Never-Miss Spark Plug Co.	60	Vitrified Wheel Works.	50
Glover, George E.	28	Newmastic Tire Co.	46	Voigt, Em.	
Goodrich Co., B. F.	Cover	New England Motor Co.			
Goodyear Tire & Rubber Co.	61	New Process Rawhide Co.			



THE NATIONAL GASOLINE TANKS

☞ The National Long Distance Gasoline Storage Outfit, which permits of placing the supply tank under ground, the pump being inside the building. In perfecting this outfit we have observed to the letter the rules of the underwriters' Laboratories, and can recommend it to be the safest and most economical way of handling gasoline ever devised ☞ This pump is one of our latest, Double Cylinder, which in operating there is no lost motion, every movement of the handle pumps and measures oil, saving time, labor and money. ☞ This outfit is especially designed for Automobile Garages. ☞ Ask for Catalogue.

THE NATIONAL TANK CO., Inc., DAYTON, OHIO

THE AUTOMOBILE

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No. 11

A FRENCHMAN'S RIDE FROM NEW YORK TO BOSTON.

By GEORGES DUPUY.

Over the telephone came this message:

"Say, I think there is a little room left for a Frenchman in an English Daimler that goes to Boston to-morrow over our nice American roads. Would you care to come?"

Of course, I accepted with alacrity Tom Moore's invitation, and it meant my first long ride in America.

Saturday morning, March 10, was glorious at 6.30 o'clock, at which hour we were noiselessly gliding through Central Park, five people packed like herrings in a barrel.

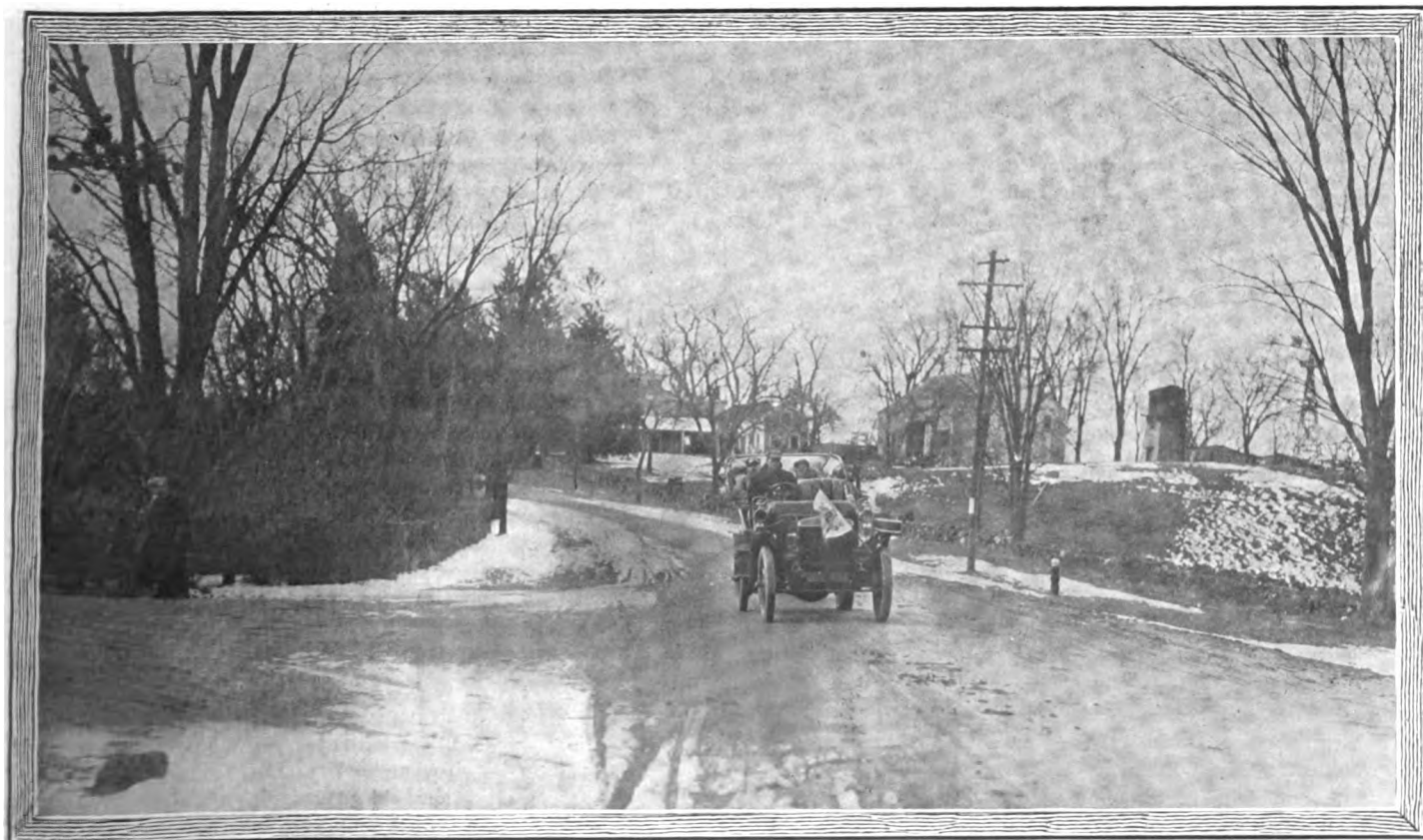
Mr. Demar was at the wheel; Mr. Carter, son of the great actress, alongside him; while in the rear seat of the tonneau, Field of the Brooklyn Eagle, Spooner of photographic bent, and myself were located. I never thought a mere photographer could be so awfully big and swollen. He had six overcoats on, and had filled the whole tonneau with cameras, extra plate holders, grips, etc. He also had an extraordinary black leather mask-cape, adorned with enormous goggles, mouth and nose holes—altogether the ugliest thing you ever saw.

I wore my old *pardessus de route* which covered with me many a thousand kilometers on the roads of France, and no goggles at all, to see the scenery better.

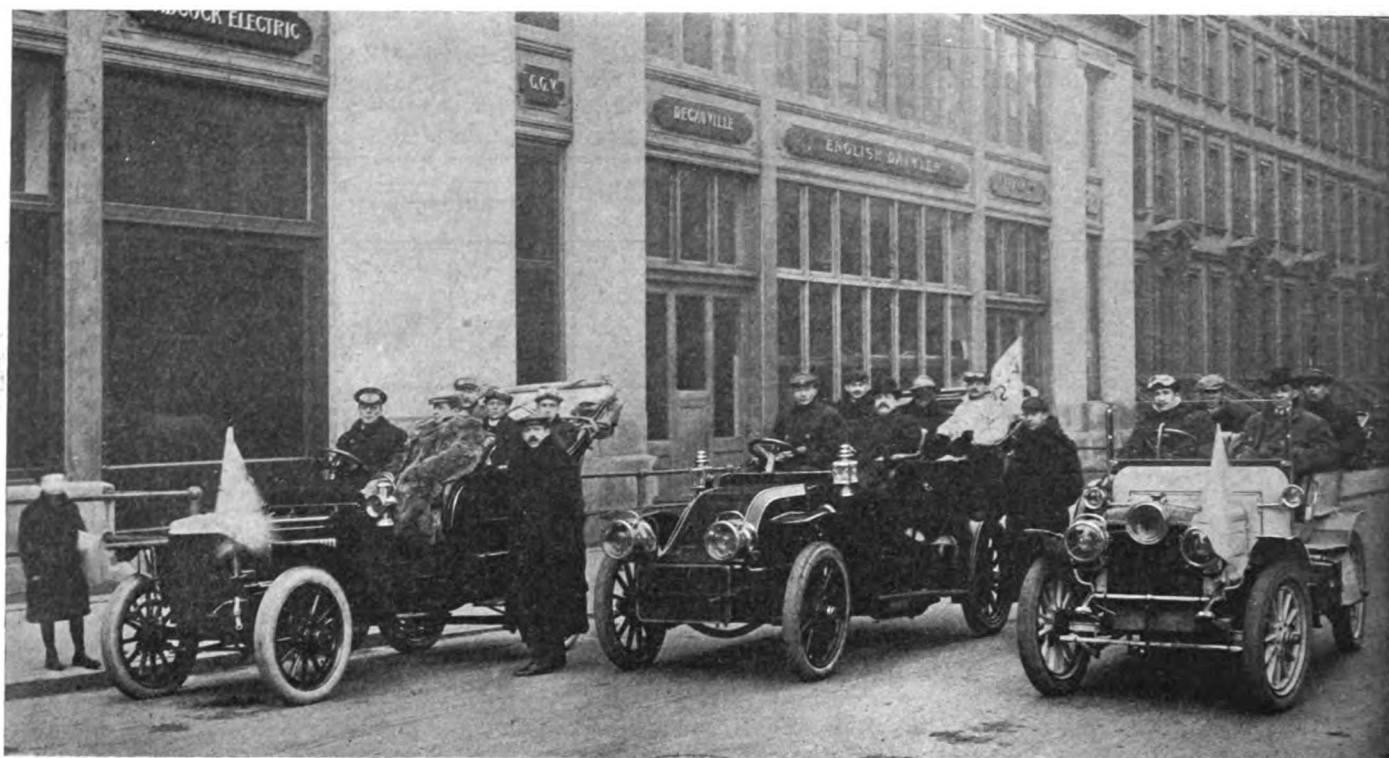
A. W. Church's C. G. V. was tearing the road ahead of us. Pretty cold morning, but the skies were of such a tender hue, and my cigar so tasty after an early breakfast.

* * *

Now to New Rochelle. The big golden globe ascends the sky and melts the last soft, dim mists of dawn. Jerome avenue—



IN MASSACHUSETTS WINTER LINGERS WELL INTO MARCH, AS THE PIONEER SPRING TOURISTS DISCOVERED.



THE DAIMLER-C. G. V. TRIO IN NEW YORK CITY JUST BEFORE STARTING FOR BOSTON.

Pelham parkway—several bridges and jumps, and harsh-looking policemen. The big red C. G. V. passes us in a rageous roaring. Our excellent machine keeps a nice, noiseless gait, and the man at the wheel knows his business—New Rochelle. Turns, trolley cars, wide avenues.

Next Larchmont. On the way to Rye, a heteroclit green car with an enormous body, full of brass trimmings, like the old stage trunks of our grandmothers, passes us on a curve, with an awful Diga-Diga-Diga-Bang!!! The driver could fly a little straighter.

The third car of our party, another English Daimler, light gray, comes by us under a road tunnel, somewhere before Portchester, but we do not allow her too much liberty. Here's a piece of straight road, not bad at all. Demar raises the throttle a trifle. Vrrrrr! and we politely pass Madame C. G. V., which is full of the loud talking of Gerrie, Reeves and Wetmore. By-bye!

Greenwich, Conn., Stamford, and terrible muddy road—ruts, side jumps and everything. I think I feel the straining of Demar's arms and wrists. Norwalk, Westport, Bridgeport. We stop, all three of us, and take gasoline. Decidedly the ride is fine.

* * * *

We continue at 9.15 o'clock. Now the powerful C. G. V. is ahead; she shows us her yellow hood for a time and glimmers in the distance. Stones and mud again above Stratford. As Nicholas, the Canadian, would say: "The automobile she jump, she jump, and bim'bye she jump some more." Suddenly while we were dancing an uncomfortable two-step, I felt a kind

of hard knock. I said to Demar, "I am afraid our rear axle touched one of those boulders."

"Never mind," he replied; and right after we struck a decent stretch of way; but the engine stopped just like out-of-breath. "What is it?"

The C. G. V. is far ahead, the other Daimler dashing after her. We are in a desolate spot, with not a soul in sight. The sky grows dark. Snow coming. We all get out, sleepy Spooner grumbling. Someone goes at the back of the car.

"Good gracious, boys, the tank is perforated, and gasoline flows out in streams!" That was the knock I felt. The big tank,

in fact a 20-gallon one, had been disjoined at both its edges and leaked very badly.

I shall not undertake the task of describing to you the long, long hours we spent in that desert, very hungry and cold, with all kinds of weather. A little boy passed by. We asked him to go to the next village and have the plumber come with a wagon to fetch the tank, solder it carefully, and take it back. The boy ran to Milford. In the meantime, we got the tank out easily enough. There was a young passenger with us who, all the time, would give advice, show the bolts to be unscrewed, talk of "gravity feed," compression, etc., with hands in his pockets. Spooner would take snapshots. White, soft snow started falling, just to increase our luck.

At that moment a funny-looking old cart, dragged by a respectable, lean, bearded white horse, passed on the road. A side sign on the wagon informed us that the driver and owner had "all kinds of pastry" for sale. We all made a rush for the blessed vehicle, and came back to the tank, our hands and mouths full of mince, apple, lemon, and what-you-call-it pies. Spooner had four pounds of chocolate eclairs in his cape and three pies in his camera.

Well, at last, after forty-five minutes, the plumber showed up, in a buggy with a nigger-fellow driving the horse. He was an old man, lame, dirty and stammering. We said "Have you got your soldering tools with you?" "S-s-say, g-gent-gentle-gentlemen, the b-b-boss he w-wants to know wh-wh-what kind—"

The old man had no tools at all, and we finally understood that he wanted to take the piece with him, repair it in his



A MORNING VISIT WITH THE MILKMAN.

shop, and bring it back. "How long will it take?" said Mr. Demar. The man said it would take about ten minutes, but the village was four miles distant, and his horse couldn't run very fast.

Well, to make a long story short, we had the tank back at ten minutes to three o'clock, having been waiting on that very spot about six hours. We replaced it in a hurry, paid the old man, got the pressure, started the engine, and than kGod, away we went.

At about one mile and a half on the way to New Haven, we sank in the mud to the hubs. We all got out again. Our driver was trying to make the clutch work with very slight foot appeals. Like an impatient beast, the motor would roar, the rear wheels turn like mad. All of us—except, however, that young man with the hands in his pockets—took old planks out of a fence near by, placed them in front of



A CONNECTICUT ROAD NEAR SAVIN ROCK THAT CAUSED TROUBLE AND DELAY.

I hope. I always will remember the splendid ride by moonlight we had then between Meriden and Hartford. Under the

longitudinally cut by trolley rails. On the top of a hill we discovered, under the moon on our left, two fine cottages posted there like sentinels, and in the distance the big electric-lighted dome of Hartford's capitol.

* * * * *

After a good rest in a good bed in a good hotel, 5.30 A.M. saw us again on the road, with all the charm of dawn surrounding us. Very high from a mountain road we saw at our feet, bathed in the rays of the sun, Springfield, and the wide, calm, clear Connecticut River. Later on it was alongside a rocky hill, a wild creek full of boulders, and then Brimfield and Warren. From there we ran on the most magnificent road I ever saw, until we struck the immense Boston boulevards in our good-natured, good-willing, powerful, and supple English Daimler, which perseveringly devoured the road, hardly sounding like a humming bee.

We arrived at Boston at 1.30 P.M.—pleased and refreshed with our varied and eventful journey. To me it was far more enjoyable than the railroad trip back to New York. The C. G. V. and other Daimler, having had good luck, had arrived in Boston the previous evening at 9.30 o'clock.



AT WINDSOR LOCKS (CONN.) THE ROAD WAS RUTTY, BUT THE CARS MET THE TASK.

the wheels, and were successful enough to get the machine out of there. Saved!

* * * * *

Now our eyes are charmed by a delightful panorama. We are traveling alongside the Sound. It is the low tide. The blue, calm sea, bordered with nightmare-looking rocks, spreads to the horizon with all the enchantment of the setting sun, which lights big fires in the clouds over yonder.

New Haven. Mr. Carter takes the train there, and we take gasoline. North Haven, Wallingford. Everything is going fine, when our left rear tire blows out. Mr. Demar, the driver, already somewhat nervous, announces that there is not a pump nor air-chamber nor even a jack in the car. Well, we are compelled to go on the rim to Meriden, three miles on pretty bad roads. A German repair man there says he can fix that in a very short time. It takes him about two hours, as there are numerous holes in the air chamber on account of its bad treatment on the road, while running disinflated. We take dinner at Meriden, and at 8.15 P.M. are ready again to take the road and try to make Hartford.

Now all our troubles are ended for good,

silvery light, fences, houses, trees, gardens, fields, cemeteries, churches, would assume strange forms. It reminded me, in some parts, of the famous "frightful lands" in our French Bretagne. Really, with the nice regular speed of the noiseless car, certain gliding shadows of the turns were quite a sensation. Further on it was Hartford, announced by wide asphalt avenues.



MASSACHUSETTS HAS MANY MILES OF ROADS SIMILAR TO THIS ONE NEAR WARREN.

Report on Farm Motors Favors Free Alcohol.

WASHINGTON, D. C., March 12.—Advocates of the bill pending in Congress to remove the internal revenue tax from grain alcohol used for industrial purposes are elated over the fact that President Roosevelt has expressed his hearty sympathy with the measure. A stiff fight against the bill is being waged by the wood alcohol people and other interests who claim they will be driven out of business if the tax is removed from grain alcohol as proposed, but so far the free-alcohol advocates seem to have the best of the argument.

Testimony on the subject has been continued before the Ways and Means Committee during the last few days, and much valuable data was submitted. A statement by C. J. Zintheo, the expert in charge of farm machinery and farm motor investigations of the Department of Agriculture, found much favor with the members of the committee. The following excerpts from Mr. Zintheo's paper are of interest:

"A few facts in regard to the use of denatured alcohol in foreign countries may be of value. Germany produced and used in 1901 denatured alcohol to the extent of 30,642,720 gallons, as compared to 10,302,630 gallons used in 1886. Of this vast amount about two-thirds was of the ordinary grade for power and heating purposes, such as costs 13 1-2 cents per gallon.

"For motor and automobile purposes the practice prevails in some sections of Germany of utilizing 30 per cent. of ordinary gasoline as a denaturing agent. Experiments have shown that a mixture of equal parts of alcohol and gasoline can be used to advantage, especially in large motors. The first attempts made in Germany to employ alcohol for internal combustion engines were not successful, the difficulty being to get the alcohol to a sufficient state of vaporization. It was only after taking the peculiarity of alcohol into consideration, viz., its difficult inflammability, that success was obtained in advantageously employing alcohol for motors. What was first regarded as a drawback in alcohol turned out to be an important advantage, for in consequence of the difficulty in igniting the air mixture it could be compressed to a greater extent in the motors, using up much more of the heat than was possible with gasoline or kerosene engines. A good alcohol motor works, when fully loaded, at a thermal efficiency of over 30 per cent., while a similarly good gasoline motor exhausts the warmth of its fuel in the most favorable case at 20 per cent., and the kerosene motor hardly reaches 18 per cent. In consequence of this, alcohol can easily compete in an economic sense with gasoline and kerosene motors. The comparative cost of operating alcohol, gasoline and kerosene motors in Germany is given as \$0.016 per horsepower hour for alcohol; \$0.017 for gasoline, and \$0.016 for kerosene.

"One advantage of alcohol engines is that not so much heat is radiated from the cylinder as in a gasoline engine, where it has to be surrounded with a water jacket and a rather large auxiliary tank of water to keep it cool. This is a great disadvantage in portable and traction gas engines. Some engines of small horsepower are now air cooled. This could be accomplished with larger horsepower engines using alcohol, which would reduce both the weight and the cost of the engines, and make them more suitable for traction purposes in plowing soil and cultivation, as well as for automobiles."

The Railroads Are Interested.

SOUTH BEND, IND., March 13.—The early Spring finds an increased sale of automobiles in this section of Indiana. South Bend officials have felt called upon to place greater restrictions on speed in the city limits. This has been caused by the demonstrators of the local factories who have been tempted to "show off" at great speed in much used thoroughfares.

South Bend is the center of more auto talk than perhaps any other section of the state; some of it has been caused by the recent appearance here of the Strang motor car,

built by the J. C. Brill Company, of Philadelphia. It has been spread broadcast that the Vanderbilt railway system is planning to largely employ auto cars on a number of lines west of Buffalo to even up matters with the electric railways, and it is generally believed that the trial trip of the Strang car is but a preliminary of some such move. The electric roads, to use an expression of a railroader, are "eating up" the steam people. Indiana and Illinois are being gridironed by the urban lines. Their tracks parallel the steam roads for hundreds of miles, and the latter are forced to make some move or abandon passenger traffic.

"It is certain that if one or more of the practical American launches, which are so popular in the United States and elsewhere, were sent here complete and given a fair trial, a ready market for them would easily be found," writes Deputy Consul Heingartner, of Trieste, Austria. "The many beautiful and interesting places in the Gulf of Trieste which can so easily be reached by water make Trieste an ideal city for motor boating, and once the superior merits of the American-made boats become known they are certain to become popular. The excellent steamship communication which now exists between that port and New York would greatly facilitate their introduction."

The Motor Boat Show of 1907.

According to arrangements made last week, the motor boat show of 1907 will be upon the lines indicated in the editorial pages of THE AUTOMOBILE two weeks since—exclusively an exhibit of launches and launch motors, with a sportsman's show on the old lines at a different date. The disadvantages of the former plan, patent to the observer at the opening of the show, were so fully impressed upon the officers of the National Association by the experience of the two weeks that the suggestion of a change met with unanimous approval.

It is now proposed to hold the motor boat show first, from February 19 to 26, inclusive; the sportsman's show following, from March 2 to March 9, inclusive. While the "popular" feature of the "Lake" and its accompanying details will doubtless be retained for the latter exhibition, the launch show will be on different lines, the entire floor space being devoted to launches and engines, and the balcony to fittings and marine appliances.

The change, which will commend itself to all patrons of the show, is in line with the experience in the various automobile shows; and far more in keeping than the arrangement of the present year with the dignity and importance of the launch industry. The lessening of the time from two weeks to one will be welcomed by exhibitors, who stand the expense, as well as by the attendants, who do the work for a long

twelve hours each day. The exclusion of a certain class of attractions which require to be advertised by the megaphone, and the raising of the technical standard of the boat and engine exhibit will act together to promote the attendance of the most desirable class of visitors and to afford better facilities for legitimate business.

There is no reason to fear that with ordinary business management and the exhibit which the launch industry is capable of today the show will fail to attract a very large attendance of yachtsmen; but even if the gate receipts should fall below the high figures of the present year, there will doubtless be a marked gain in the business done by the exhibitors.

A Ruling of Trade Import.

WASHINGTON, D. C., March 12.—Confirming a telegram to the Collector of Customs at New York relative to the entry of certain automobiles owned by Vincenzo Lancia and Louis Marks, the Secretary of the Treasury has informed the collector that the ruling may be considered general. It is to the effect that automobiles entered for touring purposes under the provisions of the Department's circular of March 18, 1905, and thereafter exported may not be reimported, either under the bond given upon the original importation, or a new bond at any time within one year.

SHOW FOR WHICH NEW ENGLANDERS WAITED.

BOSTON, March 12.—It is safe to say that no such throngs of first-nighters have been seen at any automobile show in America this season outside of New York and Chicago, as those which surged into the great halls of the Mechanics Building on Huntington avenue, when the dealers of this city opened their show Saturday night.

Such crowds at the outset could portend nothing less than unbounded interest and enthusiasm concerning motors and motorism, and they presaged a success for the show which has been amply fulfilled by the continued interest and the great local business developed at the various booths. But, after all, this great demonstration was no surprise; it had been forecasted and expected by all concerned; and, when it actually resulted, everybody was prepared to make the most of it. Boston has had successful automobile shows before. It knows how.

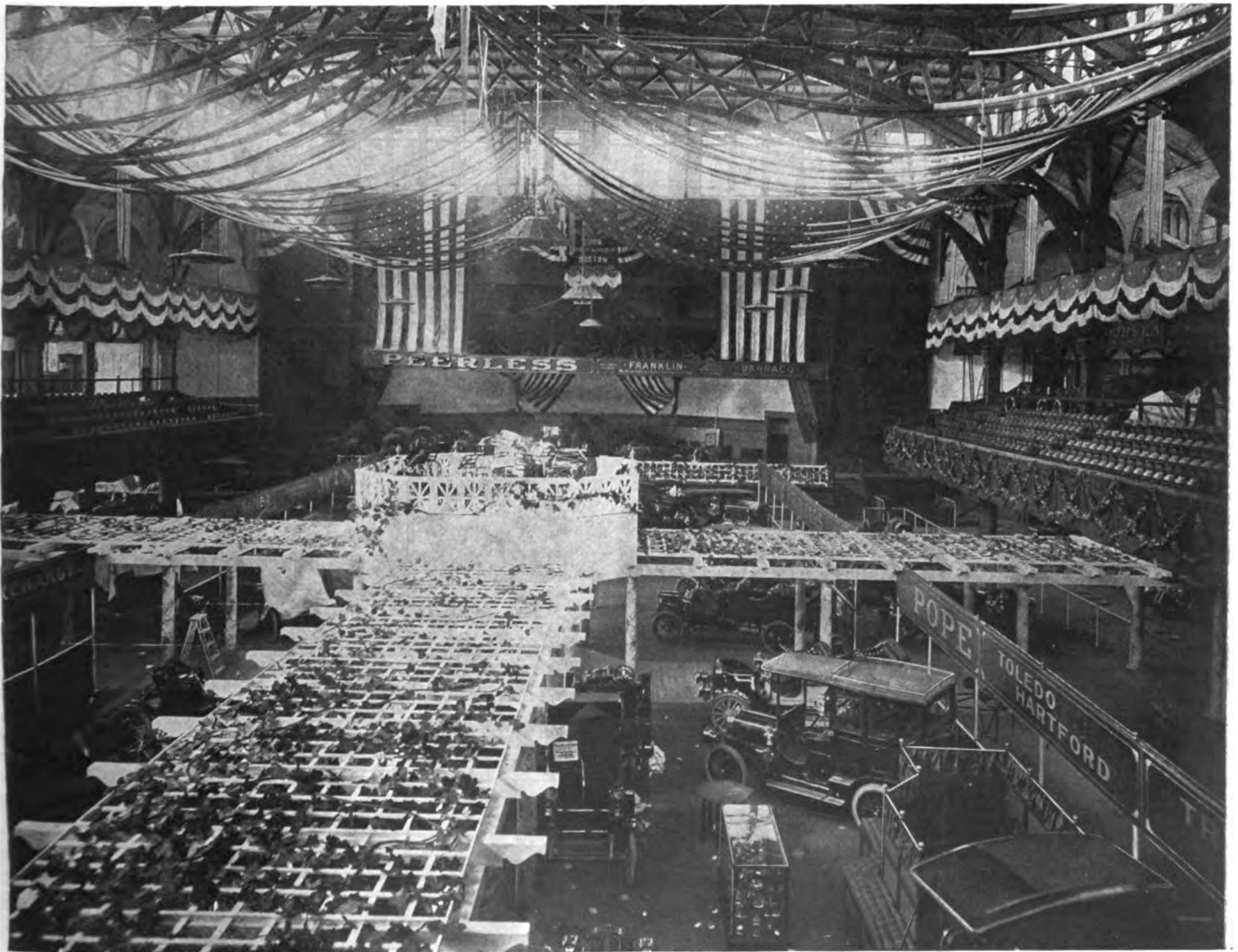
Still, the amazing popular interest in this

present show was a matter for congratulation to all those specially concerned in preparation of the vast exhibition. It demonstrated as nothing else could have done the indisputable fact that in Boston and New England, at least, the wonderful tide of popular interest in automobiles is even yet only beginning to rise in its true proportions, and that the ebb, often prophesied as likely to occur "in a year or two," is still a matter of the distant future, if, in fact, it ever really takes place. To be sure, Saturday night was the night when free tickets were due to come in by hundreds, and they came in. Hardly one out of the entire number distributed could have been wasted. But people of all classes, high and low, poured through the gates from the very outset in unending lines. No sooner were the doors opened at 7 o'clock than the rush began; and as the visitors spread themselves through the various aisles and passageways between the thickly-grouped ex-

hibits, it seemed no time at all before the two great halls were so choked with the eager sightseers that merely moving about was a difficult matter, and, as usual on first nights at the big shows, such a matter as the careful examination of the cars was wholly out of the question.

It was a brilliant scene that lay open to these first-nighters. As in the three previous shows of the Boston Automobile Dealers' Association, great attention had been paid to the grouping of exhibits and the color scheme for decorations; and there was a pleasing absence of anything garish or obtrusive. In spite of the fact that there were upward of 350 separate exhibits in the two great halls, no one was allowed to set up any sign or decoration that would in any way interfere with the general scheme, and the effect was therefore that of one harmonious whole.

Entering the triangular building from the door at the apex, nearest Copley Square,



VIEW OF INTERIOR OF MECHANICS BUILDING DURING AUTOMOBILE SHOW THIS WEEK, SHOWING NOVEL SCHEME OF DECORATION.

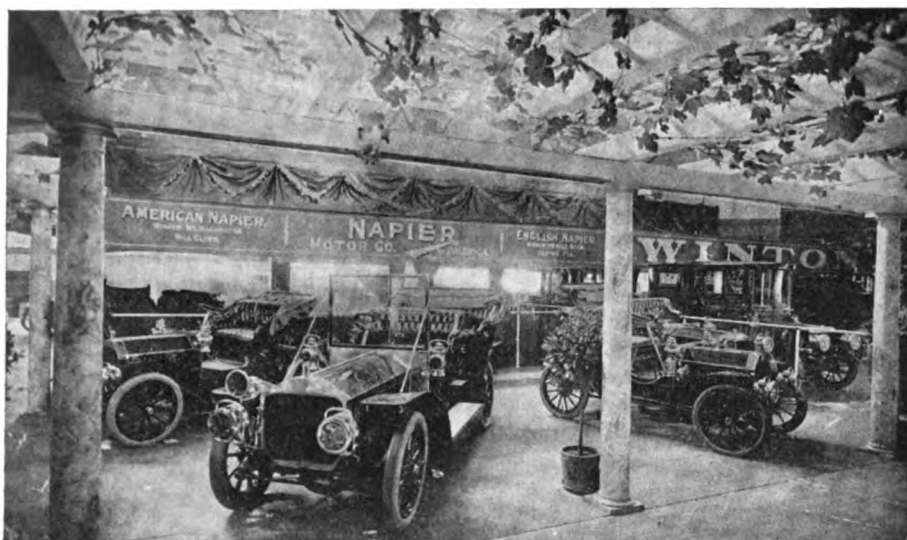


EXHIBIT OF ENGLISH AND AMERICAN NAPIER CARS AT THE BOSTON SHOW.

the visitors found an innovation along the wall of the main entry or corridor in the shape of great wooden signboards bearing mammoth diagrams of both halls, with a numbered key to designate the exhibitor holding each space.

Passing thence into what is known as Exhibition Hall, one saw, reaching out before him what appeared to be a shaded arbor in some Italian garden, the white-and-gold wooden lattice covered with grape-vine decorations and colored electric bulbs to mark the main aisle through the hall in a manner that was both novel and delightful, harmonizing very pleasingly with the grass mattings that covered the floor and the deep garnet of the burlap on the walls, and forming an agreeable sylvan relief to the purely mechanical items that were of necessity the main features of the display. All the main floor space of this hall was given to the exhibition of autos, while in the galleries and the smaller hall above were more cars and all sorts of accessories.

But the grape-arbor, as it might be called,



BERKSHIRE AUTOMOBILES EXHIBITED IN MECHANICS BUILDING.

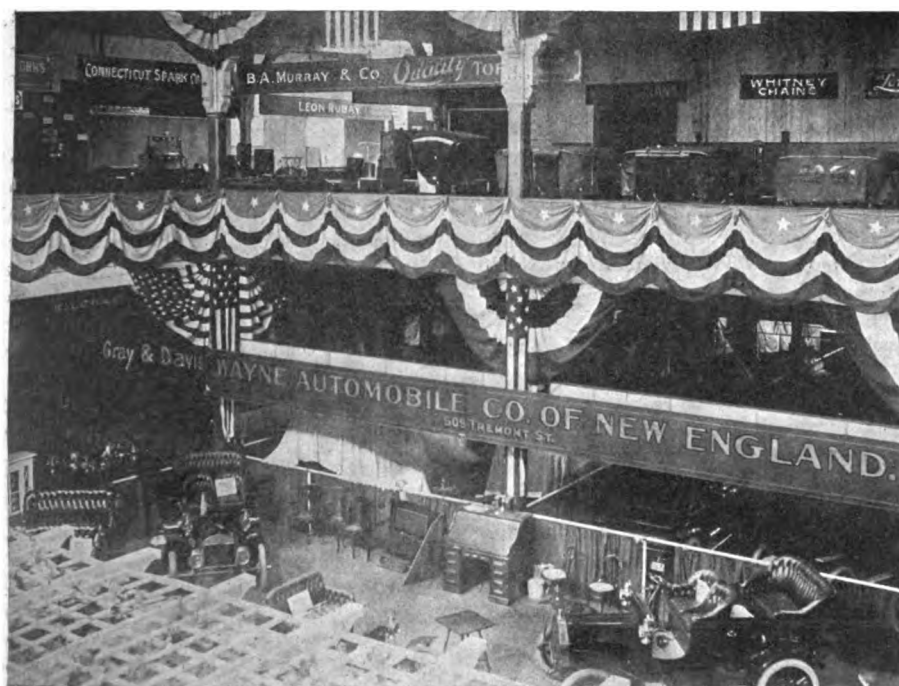
led directly through this display—which, in itself, would constitute a very respectable

toons of tri-color bunting. One thing was apparent at first glance to any visitor who has been at Boston shows in former years. This was that, in spite of the careful arrangement, the Main Hall exhibits were crowded together more closely than has ever been necessary before. Even last year, when the show first moved down to the Mechanics Building from the smaller Symphony Hall, farther up the avenue, there was plenty of room in the Main Hall, and visitors could move about easily. But the tremendous demand for exhibition space this year had the effect of jamming the exhibits closer and closer, until the conditions in this largest building in Boston were about as uncomfortable as they were at the time of the second show, in Symphony Hall.

More than this, the first balconies of the Main Hall had been stripped of the upper tiers of seats, and the space thus gained had been taken entirely by cars and accessories, or various exhibits of special interest to the automobile public. Very few were of ex-



ATTRACTIVE SETTING OF WHITE STEAM MACHINES IN THE MAIN HALL.



A CORNER OF THE MAIN HALL SHOWING SUNDRIES EXHIBITS IN THE GALLERIES.

traneous interest, about the most radical departure being the purely sporting exhibit of hides and skins, in the upper entry, which at first glance seemed rather intended for a sportsman's show than an automobile show, but in reality came pretty close to the automobilist on the score of clothing.

Whether the first-night crowds were any greater on account of the fact that the second division of this year's show, occupying the entire floor space of Symphony Hall, could not open until Monday night on account of a Saturday night concert, is hard to say. But it is safe to insist that if they expected to be obliged to wait for the Symphony Hall opening in order to see the power boats, they were agreeably disappointed. There were power boats enough in the basements of the two halls in Mechanics Building to prove beyond all cavil that the use of motors on the water, though a little behind its corresponding popularity on land, is bound to be almost as much the vogue.

New England, with its myriad lakes and streams and splendid sea-coast boating grounds, offers as great attractions to the water motorist as the magnificent New England roads offer to the drivers of motor cars; and this year's show marked the awakening of builders of motor boats to this fact.

Local builders were strongly in evidence, and their displays included practically everything in the range of power boats from a handsome 50-foot steam yacht or barge, designed for hunting and shooting trips, down through the various fascinating types of speed-makers to the tiny motor-skiffs or tenders, for use in still water on small streams and ponds. It was truly a splendid display. It was not a mere grouping of a few exhibits in a small sec-

tion of floor space; it was an area equal to practically the whole floor space of Exhibition Hall, literally crowded full of motor boats of all sorts, sizes and speeds—a display completely adequate to give the inquiring novice a good idea of the wide range of choice open to him in picking out a craft to suit his own whim or need, whatever its nature.

Although the main features of the Mechanics Building show were ready by the middle of last week, there were many of the individual exhibits that were not ready until the very moment of opening the doors to the first visitors. Mechanics and artisans

were stringing lamps, or placing cars and machinery, particularly in the power boat department, late on Saturday afternoon, and it might fairly be said that the last traces of construction work were being swept out of the back doors as the first eager ticket-holders were admitted at the front. But, considering the size of the show, this is not remarkable.

It is figured that the total number of cars displayed was 763, ranging in price from \$400 to \$12,000. Of these more than 740 were cars of American make, so that the proportion of foreign cars is considerably less than in the case of the New York show.

The number of Mechanics Building exhibitors was about 360.

Of power boats there were about sixty.

In general character, the cars shown typify the very highest work of American and foreign builders; but the general display cannot be differentiated from the big shows of January in New York. It marked the same tendencies and characteristics; for, as a matter of fact, it included not only practically all the cars shown at New York, but also in many instances virtually the same individual exhibits. Chassis, displaying the working parts of a car to the best advantage, are everywhere, and the show has all the ear-marks of the prosperity which has now become so well recognized as attaching to the major part of the automobile trade in Boston.

Symphony Hall on Monday Night.

When the doors of Symphony Hall, Boston's temple of music, and the scene of the first local automobile show that was worthy of the name, were thrown open to the public Monday evening the show was in full swing. It had been impossible to get Symphony Hall ready for the opening on Sat-



A CHASSIS, TOURING CAR AND LIMOUSINE COMPRISE THE ROYAL TOURIST DISPLAY

urday evening, because on that date it was being used by the Boston Symphony Orchestra, that aggregation of musicians known all over the country as a leader of its kind.

But as soon as the musicians had completed their program and the ladies and gentlemen in their evening clothes left the hall, a small army of workmen, led by Manager C. I. Campbell, was ready to enter, and in the very short time remaining of the work day they made a great change in the appearance of the hall. The seats were taken out and the sloping floor removed. Then the work of the decorators began. But when Sunday came they had to desist, and they left things just where it was impossible for the exhibitors to place their cars, or even to get them into the building. Therefore, it was not until well along Monday forenoon when it first became possible to put any machines into the hall. Then there was a great hustle.

The decorations of the Symphony Hall show are on very much the same scheme as in Mechanics Building. Grass-green mats are used on the show spaces and the signs are of the same red and gold, while the hangings between the spaces are of green. Along the front of the balcony pink apple blossoms are festooned. Above the stage is a great cluster of the flags of all nations, which makes a very effective center piece for the decorative scheme.

The Sturtevant Automatic Car.

A car that is attracting much attention is the Sturtevant, designed as the "automatic motor car," the claims for it being that it lubricates itself, operates its clutches, changes its gears "exactly as road resistances require," regulates its mixture and spark; and its motor, like all other engines, operates its valves and governs itself. This car, also, actuates its own brake. "The driver has only to steer," is the concluding description of its talking points.

The Shawmut Touring Car.

The very latest newcomer in the trade is the Shawmut, a \$3,500 touring car of 35 to 40 horsepower and weighing 2,400 pounds. Symphony Hall captured the exhibit, which was at all times during show hours a strong center of attraction as the car is of local manufacture, being built by the Shawmut Motor Co., 901 Boylston street, Boston. The company is headed by Elliot C. Lee, lately president of the American Automobile Association. One model of the car is shown together with a display of rough and finished parts. Its appearance is one of solidity and strength united with a fine regard for style and finish. The power plant is almost a replica of the Panhard type, with some modifications. The crankshaft has the five ball bearing supports. The extra bearings are placed immediately between the bases of the cylinders in both the front and rear sections of the crankcase. Four ball bearings also support the camshaft.

All ball bearings are of French manufacture—Malicet & Blin—and their liberal use in every part of the car is with the object of reducing resistance to a minimum, so that the percentage of power delivered by the motor to the rear wheels will be exceptionally high. The transmission is of the straight sliding type, with reverse effected by a single gear and cam.

The motor is four-cylinder, vertical, of 4 1-4-inch bore by 5 1-2-inch stroke, with inlet and exhaust on opposite sides. The flywheel, which is 22 inches in diameter, has specially designed blades and makes a very effective fan. Make-and-break ignition is furnished unless otherwise ordered. All gears are planed from hammer forged nickel steel and toughened by a special annealing process.

Model 6, the car shown, has a wheelbase of 112 inches and 56-inch tread. The body is finished in dark blue and has double side entrance with divided front seat. All metal trimmings are of non-corrosive nickel steel.

Novelties and Sundries.

Three new flexible shaft specialties are shown by the Coates Clipper Mfg. Co., of Worcester, Mass. The first is an auto buffing equipment which consists of a flexible shaft, buff and holder and sheave pulley. By a simple rigging of the pulley to the floor and connecting same by belt to the flywheel of the motor, the power of the automobile can be used to revolve the buff by means of the flexible shaft. All bright parts of the car can be reached readily and the work of polishing can be performed with rapidity.

The second novelty to be mentioned in this exhibit is a flexible portable arm, which consists of a small engine outfit for rowboats. This is supplied with a flexible propeller shaft carried up and over the stern of the boat, and from that point to the propeller itself through a rigid curved tube which is attached by a clamp to the stern of the boat. The outfit can be applied to any shape of hull.

A new lightweight breast drill equipped with flexible shaft completes the Coates Clipper trio. It is built in two sizes, weighs two pounds and can be stopped and started at will without stopping the motor to which it is attached by the flexible shaft, which it is attached by a flexible shaft. All described articles is of the Coates unit-link type.

The Eco Manufacturing Company, 53 State street, Boston, shows a new acetylene gas generator which not only makes the gas, but also stores it under pressure. It is called the Eco-Safety. The makers emphasize the storage feature of their product as one of great economy for users, as the efficiency of the present storage tank is combined with the convenience of making your own gas. A pressure regulator between the generator and the lamps and a

device for drying and filtering the gas, is designed to increase the efficiency and candle power of the light. The outfit is enclosed in a neat box so that it can be attached to the running board of the car.

A new meter for registering speed and distance made its initial appearance at the Boston show. It is called the Federal, and is manufactured and marketed by the Chandler & Farquhar Company, 36 Federal street, Boston. The meter has a clear, open face, and is easily adjustable to any car; shows the speed from five to sixty miles an hour, and registers both trip and season mileage. It is cup-shape in form, handsomely finished, and is sold with all attachments, ready for use on any style of car.

Business Is Brisk and Big.

Business began with a rush at Mechanics Building Monday morning. The Saturday night crowd was one made up almost entirely of people who were glad of a free ticket to go to the automobile show. The automobilists and those who expect to be automobilists and who had any inkling of the opening night crowd stayed away. Therein they were wise. But by Monday morning the character of the attendance had changed altogether. It was a crowd of buyers, and of persons purchasing for their own use. It was not an attendance of agents, for most of the New England agencies have been placed for this season, but it was a crowd of people who took advantage of the morning hours to make their final examination of the cars before placing their order.

Boston's New Trade Affiliations.

The new machines in the Boston market which are being handled by old members of the trade have the advantage of those which are in charge of new men. Thus Harry Fosdick and J. A. Dowling, with the Fiat and the Studebaker; A. E. Morrison, of the Morrison-Tyler Motor Company, with the Rainier, the Maxwell and the Marion; George H. Lowe, with the Wayne, and S. H. Baker, of the Baker-Cormerais company, with the Premier, have a great advantage over less well-known men in putting out new machines.

The many changes that have taken place in the local trade in the past year are made very conspicuous at the show. Thus J. L. Snow, formerly head salesman of the Peerless, is now manager. The same is true of Freeman Hinkley, of the Pope company, and J. A. Hathaway, of the White. Notwithstanding the many changes, there are plenty of the old standbys, such as A. R. Bangs, of the Franklin and Darracq, J. W. Maguire, of the Pierce, A. P. Underhill and George G. Reed, of the Knox and Stearns, C. S. Henshaw, of the Thomas, E. A. Gilmore, of the Rambler, A. T. Fuller, of the Packard and Cadillac, J. M. Linscott, of the National and Reo, and J. H. MacAlman, of the Locomobile.

Buffalo Urges Her Claims to Open-air Show.

BUFFALO, March 12.—It has not yet been definitely decided that Buffalo will get the first annual out-door show of the American Motor Car Manufacturers' Association, to be held this coming fall, but local enthusiasts are cheerful over the way in which R. B. McMullen, of Chicago, general manager of the association, spoke of Buffalo's facilities for such an exhibition, and there is a general impression that the Queen City will secure the show. Mr. McMullen spent several days in Buffalo last week attending the automobile exhibition at Convention Hall and looking into the advantages Buffalo offers for the open-air show. Several other members of the association were also here.

Mr. McMullen praised the local show, and when asked about the probability of Buffalo getting the open-air exhibition, said that he intended to look the field over thoroughly before leaving. He had been out to Kenilworth racetrack and had looked over that site. He was favorably impressed, he said with the advantages the park offered. Mr. McMullen asked if there were any hills in that vicinity for climbing tests, and he was assured that there were.

Wednesday morning a committee of aldermen, composed of John J. Kennedy, George J. Haffa and John Collins, met the committee from the manufacturers' association at the Iroquois Hotel and urged the selection of Buffalo as the place of holding the first outdoor exhibition. The visiting automobile men said they would seriously consider this city's chances.

SUCCESS OF BUFFALO SHOW.

More than 50,000 Attendants, Many Sales and Everybody Pleased.

BUFFALO, March 12.—The closing "honk-honk" of Buffalo's fourth automobile show was sounded promptly at 10.30 o'clock Saturday night, much to the regret of the large crowd which filled Convention Hall and the many exhibitors who had made a "good thing" of the show. The final honk-fest was the signal for the exhibitors to prepare to move on to the next stand—Boston.

Immediately the exhibition cars, chassis and other exhibit features were prepared for shipment and then carted by truck to the railroad yards. Probably the biggest automobile train that ever traveled on a railroad left Buffalo early this morning for Boston. There were thirteen express cars, making up a special train, with each car filled to its capacity with show automobiles and appurtenances.

The men who were responsible for the show are highly elated by its success. Manager Dai H. Lewis said that more business was done at the show this year than at any of the three preceding shows held here.

"They all did business," said Mr. Lewis,

"the sundries dealers, motorcycle makers, the manufacturers of the big cars and everybody that had an exhibit. As for attendance, we had more people here this year than at any other show. The total attendance, exclusive of the exhibitors and the attendants at the exhibits, has been far more than 50,000. That's a good record, and indicates what will be done if the big autumn outdoor show is held here. Everybody is thoroughly satisfied."

There was nothing pertaining to a motor car which was not exhibited at Buffalo's show, and the range of cars was wider than ever before. The commercial vehicles occupied a prominent place and the number of business wagons exhibited indicates that there is to be a more determined effort this year than ever to substitute gasoline and electricity for horse flesh in the delivery of goods.

That the electric automobile has many adherents was demonstrated by the large crowd always surrounding the exhibit of the Babcock company.

"Sold" cards were plentifully displayed on the cars at the show. One man, new in the business, claimed he had placed special orders for seventy-two cars. One motorcycle exhibitor took orders for eighteen machines.

A show for Buffalo next year seems assured, but before the time arrives, those in charge hope to have a better and bigger place in which to hold it.

How to Discourage Speed.

CHATHAM, N. J., March 12.—This borough, known in automobiling circles as harboring the most drastic anti-automobiling sentiments of any place in the state, has awakened from the lethargic sleep in which it has lain for several months past and has taken up the cudgel against motorists once more.

Tired of warning and arresting car owners who, the officials declare, pass through the pretty Morris county towns faster than the law allows, the common council, at a meeting, has decided on a new method of warfare. Their scheme is to make automobiling over the borough's streets so unpleasant, even dangerous, that motorists will give Chatham a wide berth.

It is proposed to re-lay the crosswalks on the prominent streets, leaving them exposed five inches above the level. The stones have already been ordered, and the work will be begun at once. Whether the approach of the crosswalks will be up a low embankment or whether they will stand up sheer in the roadway has not been decided. One or two walks with both kinds of approaches will be laid before that point is determined.

It was the intention of the councilmen to make the height three inches instead of

five, but a statement made by Frederick R. Pratt, president of the Associated Automobile Clubs of New Jersey, to the effect that a two-inch rise would occasion automobilists no annoyance, and that even an obstruction three inches high would not do the damage to cars expected, decided the body in favor of the extreme height.

Horsemen and owners of carriages were evidently not taken into consideration, although it was said before the meeting of the councilmen that such an ordinance would make ten times the trouble for drivers of horse-drawn vehicles, with their iron or hard rubber tires, than it would cause automobilists. It was the opinion of some that a heavily loaded wagon could not be driven over an obstruction so high.

The marshals of the borough are said to be opposed to the ordinance because it will take away a large part of their income by compelling automobilists to go slowly or to keep out of the place altogether.

Just why there is so much opposition to automobiles in Chatham is hard to say. The town has 1,800 inhabitants, and many of the residents and property owners are New York or Newark business men. The place is looked upon as an aristocratic suburb of Greater New York.

PHILADELPHIA STAGE LINES.

Two Companies Organized to Operate to Chester and Atlantic City.

PHILADELPHIA, March 12.—Last year's experiment of operating a tri-weekly auto-coach service between this city and Atlantic City, which was made by a local promoter, was so successful that the coming season will see a regular line established, not only for the transportation of passengers, but for freight, mail and express packages as well. Articles of incorporation for such a line to operate between Camden and Atlantic City, under the name of the Camden and Atlantic Automobile Company, were filed in the former city last Wednesday. The authorized capital is \$25,000, and the incorporators are I. Dare Cindhart, Jr., Charles Sumner Wesley and M. Leon Berry.

Another line, for passengers only, is projected between Philadelphia and Chester, over Woodland avenue and the Chester Pike, the charter notice of the Philadelphia and Chester Coach Company having appeared last Wednesday. Application for a charter will be made on Monday, April 2, the incorporators being J. Frank Black, George C. Hetzel and George W. Atherholt.

Neither of these lines will tap virgin territory, both being paralleled by steam roads, the latter having also two trolley lines to compete against.

The British Motor Union proposes to hold special headlight trials to see whether it is not possible to do away with the glare constantly complained of by the general public. The Union has placed itself in communication with the makers.

The Value of Trees on Highways.

In his message to the New York state legislature, Gov. Higgins recommended that shade trees be planted along the improved highways, and that the expense thereof be included in the contract for the improvement of the road. The governor spent a part of last summer in Europe, and undoubtedly in France was impressed with the careful construction and maintenance of the highways and the frugality of the French people in that they planted shade trees along the road, not for the one purpose only of beauty to the traveling stranger, but for the purpose of holding moisture in order to keep the stone roads from raveling, as they do when they are dry and the little stones roll apart from one another.

This raveling is prevented if the road is sprinkled, but the thrifty Frenchman has learned that it is cheaper to plant trees and hold the moisture in the air around the road in a natural method, rather than to pay taxes to have a man run a sprinkling cart.

The thrifty Frenchman has also learned that on his 25,000 miles of main road, which are built and maintained by the nation, he is in reality maintaining a forest from which he is able to cut a certain number of trees each year, which he sells, and thus obtains a revenue toward road maintenance. In place of the trees that he cuts he puts out new ones and there is a constant succession of new trees being planted and old trees being cut.

The serious question in New York state of the loss of timber from the watersheds makes it highly advisable that wherever practicable trees should be planted along all stone roads to protect them from raveling. Trees are not planted along gravel roads, as it would make them too muddy, but when planted along stone roads they are very valuable toward maintaining them economically.

A TOLL ROAD IN THIS DAY.

PITTSBURG, March 12.—The Wilksburg Boulevard Company has applied for a Pennsylvania charter and proposes to build a 40 per cent. grade road between Wilksburg and Braddock, and later to extend it to East Pittsburg. E. R. Reno, J. F. Kinkade and F. W. Schornagle are the incorporators, and Senator John S. Weller is pushing the project. This road is the beginning of what promises to be better roads in western Pennsylvania, especially at those points where country roads have not been laid out and improved at the expense of Alleghany county.

The proposed boulevard will be fifty feet wide, and it is said that little trouble is being experienced in getting the rights of way. The road will be in the nature of a turnpike, and small fees will be charged automobiles and other vehicles, thus giving the company a fair revenue. The East

Pittsburg Improvement Company has secured much of the land along the proposed road and proposes to establish thereon a colony of automobile owners. The new grade of the road and its direct connections with the city make their project very feasible.

Buffalo Club Wants Trunk Roads.

BUFFALO, March 12.—The Automobile Club of Buffalo has adopted a strong set of resolutions relating to the good roads improvement work. Copies have been sent to Erie county's legislators. The resolutions are as follows:

Whereas, The people of this State have authorized the legislature to promote good road building by employing the credit of the State for that purpose to the extent of \$50,000,000 at a time, and without limit to the amount that ultimately may be spent in carrying out that policy; and

Whereas, There is a movement in some of the counties of the State in favor of dividing among the counties the first \$50,000,000 raised by the State for good roads, to be expended on such highways, and in such fashion as local officials shall direct, and bills to that effect are pending in the Legislature; it is therefore

Resolved, That this club, representing owners and operators of nearly 3,000 automobiles, is strongly in favor of having a good roads policy carried out by State officials with a view to the highest benefit of the State as a whole, under legislative act for that express purpose.

That it is opposed to the policy of dividing the State fund among the counties on the basis of mileage, population, valuation, or any other scheme of getting at the money to spend it as local authorities may see fit.

That a comprehensive plan of trunk lines running east and west should be laid down by the State Engineering Department and another plan of trunk lines running north and south should be adopted in connection with the main line east and west, and that lateral lines should be constructed only in connection with main lines to the end that, finally, all lines shall be parts of a sound system that may be developed to any degree, but always in harmony with the general plan.

That a rational plan of highway improvement is impossible if the State fund is permitted to be handled by local officials, along with the mixture of politics and pull that such operations always attract, and with only selfish local interests in mind.

That the Legislature should enact a statute retaining the many admirable features now included in the law, but laying down a broad policy to govern in the great amount of new work to follow the appropriation of large sums of money under the recent amendment to the Constitution.

That such statute should put good roads improvement under the control of the State Engineering Department as far as the State contribute money to that end in any county.

Indiana Good Roads Proselyting.

INDIANAPOLIS, IND., March 12.—Within a few weeks a good roads movement, that it is expected will spread throughout the entire state, will be taken up in Indiana. Frank Staley, vice-president of the H. T. Hearsey Vehicle Company, is back of the

movement. It is not likely that the plan will take the form of an organization, but that a few of the best-known motor car enthusiasts of Indiana will take up the work by individual efforts. The plan will be for this self-appointed committee men of much influence, to visit the county commissioners throughout the state and urge that the roads be improved.

In brief, the committee will do missionary work where it is needed. One of the principal features of its work will be to visit the farmers along the different proposed routes and impress upon them the importance of good roads, not only for motor car drivers, but for the farmers as well.

The first route to be taken up will be a new route from Indianapolis to Chicago that has just been "discovered" by Mr. Staley during a tour in his White steamer. The new route will make it possible for drivers of this city to make the trip in one day, and it runs through Frankfort, Lafayette, Remington, Valparaiso and Hammond.

Good Roads Doings.

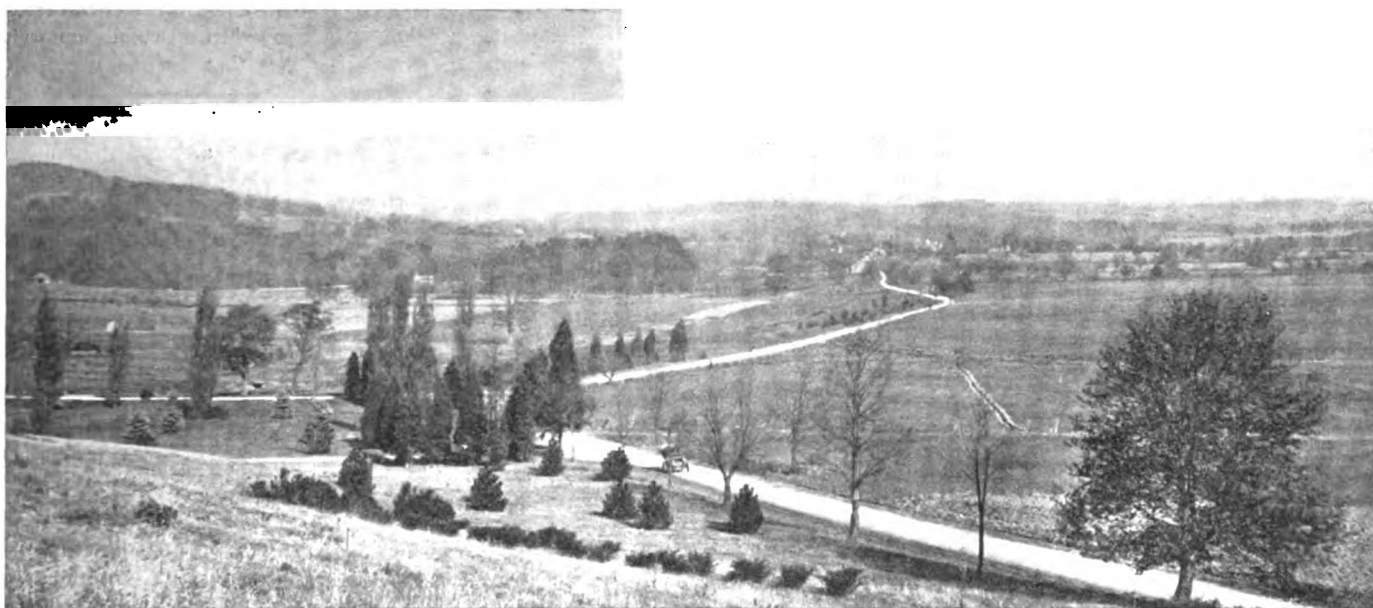
Rhode Island has been particularly energetic during the past four years in the improvement of its highways. At the present time the state possesses, or has in process of construction, 170 miles of macadam highway, which within the next two years will be increased to 249 miles. The work on the roads has met with general approval, and at the last general election a large appropriation was voted for the continuance of the work.

* * *

The third annual convention of the New York and Chicago Road Association will take place at Hornellsville, N. Y., March 20 and 21. The Southern Tier Good Roads Association will be represented, and both the city council and chamber of commerce of Hornellsville will assist in making the convention a notable one. Prominent speakers and good roads advocates have been invited to attend.

* * *

In the discussion of the merits of the Brownlow-Latimer good roads bills before congress the very first fact to be considered is that good roads are the greatest factors of profit, comfort and convenience ever sent to bless the people of any land, and that they contribute abundantly to enhance the national life and to offset the influences that tend to concentrate population unduly in the large cities to the discomfort and detriment of the community at large. Another primary fact is that where financial ability and intelligent zeal have striven to solve the road question the aggregate value of property has been so greatly increased by good roads that it is impossible to overestimate it.



A GOOD SAMPLE NEAR MORRISTOWN OF THE NEW JERSEY ROADS WHICH ARE THE JOY OF THE AUTOMOBILIST.

The Battle of Trenton Undecided.

TRENTON, N. J., March 12.—The Committee on Judiciary's substitute to the Frelinghuysen Bill to-night passed the Senate on a second reading and will now go to the House. Predictions are made that the measure may become a law in spite of its drastic regulations, though the automobilists, under the direction of the Associated Automobile Clubs of New Jersey, will make a most vigorous protest in the Senate.

A clause which might have interfered with the effectiveness of the bill was discovered and amended by Senator Frelinghuysen. The committee substitute contains these important provisions:

(1) No chain tires to be used on the roads of New Jersey unless the road which is traveled is covered with one inch or more of snow or ice.

(2) Automobiles must carry devices to prevent excessive noise; also device to prevent the falling of embers or waste from fuel used in machine.

(3) Provides for organization of Commission of Registration and Regulation, to have not more than twenty-one commissioners throughout the state, each having power to arrest without warrant, also having power to stop machines and discover if driver has complied with sections of this act.

(4) No person shall operate a machine who has not first been examined by a commissioner in a trial trip in kind of machine to be used.

The Frelinghuysen bill provided a speed of one mile in seven minutes, and this was changed to one mile in five minutes.

Machines of less than 30 horsepower are to be taxed \$3 a year; of more than 30 horsepower, \$5 a year. Summons on non-resident automobilists may be served on the Secretary of State, and for this a fee of

\$2 per year must be paid. Motor cycles are to be taxed \$1 per year.

Manufacturers' licenses, good for five machines, are to be issued for \$20. All present licenses are to expire July 1 next.

Are the Railroads Responsible?

TRENTON, N. J., March 13.—"Good-morning, Senator, will you introduce an automobile bill to-day?"

"Not to-day. You know I introduced two yesterday, and have another for to-morrow."

"That's good. My third bill comes up for second reading this afternoon, and I hope you'll help it along all you can."

"Sure. And I'll expect you to vote for my amendment to Jones' bill, compelling payment of all automobile fines in cash."

"I certainly will."

And the two Jersey lawmakers part for the nonce, each with the proud consciousness that he is conserving the interests of his agricultural constituents. And all the time these Solons and their confrères are playing the game of the railroads—keeping the farmers occupied with the automobilists while the greater question of a fair taxation of railroad property in the state is allowed to play second fiddle. There is some reason for the assertion that the railroads are responsible in a measure for the multiplicity of bills having for their object the keeping of the automobilist within bounds.

Somebody has told the farmer that he builds the roads and that the automobilist—who is almost always a city man—tears them to pieces. When the myriad of bills are boiled down, toward the end of the session, into one measure containing the best—or worst—points of all, it will be demonstrated by those who are fighting

these bills that neither statement is correct—that the worst damage is done by the narrow-tired wheels of the farmer's wagon; that the proportion of taxes paid by the city and town resident for road construction and maintenance is as 4 is to 1 compared with the farmer; that the farmer is not charged for the use of the streets when he brings his produce to the city market; that city resident pays for street improvement in front of his home, whereas the state and county build and repair roads on which the farmer's lands abut.

Automobilists generally are willing to submit to reasonable regulations to keep the road incinerator within bounds; but the numerous nonsensical propositions, such as that which proposes toll gates ten miles apart, with telephone connection to keep tabs on the rate of speed, and a charge of ten cents per passenger, must be eliminated.

Meanwhile the railroad lobby is looking forward to adjournment day and ramming in a new bill now and then to keep the farmers' minds occupied.

In Progressive Vermont?

MIDDLEBURY, VT., March 12.—At the town meeting of March 6 the town voted, after considerable discussion, to prohibit the running of automobiles upon the main highway between what is known as the Isaac Rogers corner and the Middlebury-Ripton town line.

As passed the resolution authorized the selectmen to post the road in question, which covers a distance of about seven miles and is about half of the distance between Middlebury village and the Bread Loaf Inn in Ripton.

The British Motor Volunteer Corps is being reorganized to give it a stronger military standing.

The District of Columbia Bill.

WASHINGTON, D. C., March 12.—Congress is determined to force the Sims Bill regulating the speed of automobiles in the District of Columbia, and for other purposes, upon the automobilists of this city, notwithstanding the adverse report on the bill made by the district commissioners. The House Committee on the District of Columbia have considered the bill in all its phases, and have reported it to the House with a few slight modifications and the recommendation that it be passed. The speed limitations provided in the bill as reported are the same as the existing police regulations with one exception, the committee deeming it wise to reduce the speed of automobiles in crossing streets where there are no steam or street railway tracks to eight miles an hour instead of the existing regulation of twelve miles, this constituting the only change in the present regulations. Upon the recommendation of the district commissioners the provisions of the bill are made applicable to horse-drawn vehicles. In its report the committee says the necessity of regulating the use of public thoroughfares of the city by law is recognized.

Among other things the committee's report says: "Your committee is of the opinion that the punishment of offenders by fine is not sufficient to break up the practice of operating automobiles in excess of the speed limit provided by the regulations in force, and that imprisonment, at the discretion of the court, for the second and third offense is absolutely necessary in order to effectually check the tendency to over-speeding. Your committee believes that the limitations of speed provided in the proposed legislation are reasonable and necessary, and that the punishments therein provided, while not harsh or excessive, will be sufficient to break up the practice of over-speeding of all kinds of vehicles in the District of Columbia, and that the same will be easy of enforcement."

The penalty for the first offense is a fine of not less than \$5 nor more than \$50; second offense within one year from the first offense, a fine of not less than \$10 nor more than \$100, or imprisonment for not less than five days nor more than thirty days, at the discretion of the court; for the third offense within one year from the first, a fine of not less than \$50 nor more than \$250, or, at the discretion of the court, imprisonment in the workhouse for not less than thirty days nor more than six months.

The bill now goes to the House calendar, and the chances are that it will be speedily enacted into law. The Automobile Club of Washington is seeking to enlist the aid and influence of certain senators and representatives who are automobilists to defeat the measure. It is an uphill fight, and the

chances are all against the automobilists winning out.

Sims Bill Passes Without Dissent.

WASHINGTON, D. C., March 13.—To-day the House of Representatives passed the Sims automobile bill unanimously, despite efforts of Representative Gillett to secure certain amendments. Representative Gillett thought the bill in many respects unreasonable, to which Representative Sims replied, "If there is anything the matter with this bill, it is that it is too lenient."

When the amendments had been voted down, the bill was passed without dissenting vote.

REGISTRATION IN OHIO.

Bill Reported Favorably by House Committee Likely to Pass.

COLUMBUS, O., March 10.—The House Committee on County Affairs of the Ohio legislature has reported in the bill of Representative Bowers requiring all owners of automobiles to register with the county auditor of their respective counties and to display identification tags. This seems to be the only measure of the kind destined to pass at this session. There are in the hands of the committee several other bills affecting automobiles, and the probabilities are they will die there.

In view of the favorable action of the committee it is very probable the bill will pass the House of Representatives. Whether or not it will go through the Senate is a question. The session is drawing to a close, and that body may not get to it before final adjournment.

The Bowers bill provides a fine of \$5 to \$50 for violation of its provisions.

Maryland has a Weird Bill.

BALTIMORE, MD., March 10.—Four bills concerning the automobile have already been introduced in the Maryland legislature this session, and the past week has seen another added to the list. Just why this latest legislation is desired has not yet been explained, because the bill has been temporarily suspended, pending revision on account of a clerical error, but, in brief, its object is to prevent the running of an automobile in Dorchester county on Tuesdays and Saturdays, except when its occupant is a physician hurrying to the bedside of a patient.

As a sample of freak legislation, this automobile bill was substituted in place of one which had been unfavorably reported by the judiciary committee of the house. It was not regarded in a very favorable light until J. W. Hastings, who introduced it, said that the county people were clamoring for it. This statement naturally had the effect of enlisting the support of many members of county delegations. However,

it is thought that it will meet with successful opposition when it comes up on the floor, if it gets that far.

The Situation at Albany.

ALBANY, N. Y., March 12.—Assemblyman Cox's bill to allow owners of motor vehicles who are arrested for violations of the automobile law in New York State to give as security for the appearance at trial the bond of some security company instead of cash or leaving their motor car as a bail bond has been passed by the Assembly.

The amended L'Hommedieu auto-tax bill is still in the Senate committee on taxation.

Senator Grady Monday night reintroduced his bill of last winter which declares that all persons have a right to be on the highways, and no person shall drive or ride at a rate of speed which may be dangerous to others. When the driver of an automobile refuses to decrease the rate of speed he is guilty of misdemeanor, according to the provisions of the Grady bill. Another provision makes a driver guilty of assault in the first degree if in case a person is injured he attempts to escape or neglects to stop to inquire as to the character and seriousness of the injury.

Can't Bar Motorcycles.

Despite its desire to do so, Reidsville, N. C., cannot keep motorcyclists off its streets, and the three motorcyclists who reside there are now free to brush the dust off their machines and use them without fear of fine or imprisonment. Reidsville passed a by-law prohibiting their use and for a time the by-law was respected, but backed by the Federation of American Motorcyclists, a member of that organization, David L. Carroll, has just succeeded in convincing the "city dads" of Reidsville that they have no right or power to pass laws of the sort.

Bingham Wants Autos.

Police Commissioner Bingham, of New York City, obtained, on Monday, the permission of the aldermanic finance committee to purchase three touring cars without advertising for bids. Commissioner Bingham declared it was necessary for the department to have the best American cars in the market in order that he and his deputies, leaving headquarters for a tour of inspection in Queens and Richmond boroughs, might be sure of getting back without delay. He added that for the present he intended to have the automobiles run by uniformed policemen, but that he would soon be back for another appropriation to provide funds to engage civilians.

At the next election the voters of St. Joseph township, Michigan, will vote on a proposition to bond the township for \$29,500 for the purpose of constructing new roads throughout the township.

The N. A. A. M. March Executive Meeting.

The Executive Committee of the National Association of Automobile Manufacturers held its regular monthly meeting March 7 at the association headquarters, No. 7 East Forty-second street, New York City. Herewith is the official report of the meeting, as given out by S. A. Miles, general manager, to N. A. A. M. members:

Your attention is respectfully called to the following resolutions adopted by the Executive Committee at its regular monthly meeting, March 7:

RESOLVED, That this association is opposed to the holding of contests in the United States which have not been approved by its Executive Committee, and that it shall not be permissible for any member to take part in any unapproved contest under penalty of being debarred from participation in such events as may be held with the approval or under the auspices of this association.

Members have, from time to time, complained that attempts are made in various parts of the country to promote contests and secure the support of manufacturers. In the opinion of the committee there is danger that these will increase in number to such an extent as to become a serious burden. It is not the intention of the committee to attempt to "sanction" contests in the same way as it has done local shows, but it appears to be necessary to make such recommendations as will insure uniformity of action.

RESOLVED, that in the opinion of this Executive Committee it is unnecessary and unbecoming the dignity of a member of this association to publicly offer a guarantee exceeding 60 days, or varying in any essential detail from the guarantee adopted by this association.

The committee has received complaints that the form of guarantee adopted by this association has not been strictly observed, and that not only has the time been extended in some cases to as much as one year, but that, in a few instances, guarantees have been given to keep a car running, under any and all circumstances, except accidents due to carelessness, for twelve months. The committee believes that the class of manufacturers composing the membership of this association is such that a sixty-day warranty should prove ample. It is the desire of the committee that members adopt and adhere as strictly as possible to the present form. The committee realizes that in some cases the form for 1906 has been published and can hardly be changed, but hopes that the use of any other form will be discontinued as promptly as possible.

WHEREAS, in the opinion of this Executive Committee, the local shows of 1906 have not been productive of benefits to the industry commensurate with the loss of time and expense involved; be it

RESOLVED, That no shows shall be sanctioned hereafter except one annual

show at New York and Chicago, and that the resolution relative to exhibits at unsanctioned shows be continued in force.

The resolution referred to provides that no manufacturer who exhibits at an unsanctioned show shall be permitted to exhibit at a sanctioned show for a period of eighteen months.

The association realized approximately \$25,000 from the Chicago show, one-half of which will be distributed among those who had exhibited at at least one earlier Chicago show, held under the auspices of this association in proportion to the amounts paid by each. The distribution will be made at an early date.

The association's test case, in New Jersey, designed to test the validity of laws which require an automobilist to take out more than one license and to determine other minor points has progressed so

rapidly that it has been heard in three courts and is now before the Supreme Court of New Jersey. It will reach the Court of Errors and Appeals in June, and it is therefore probable that within the brief space of six months we shall have been able to secure the decision of the highest court in the state.

W. E. Metzger has been elected a member of the executive committee in place of R. D. Chapin, resigned.

Following is a list of committees for the ensuing year:

Membership—Messrs. Davis, chairman; Owen, and Bennett.

Show—Messrs. Budlong, chairman; White, Hildebrand, Bennett, and Metzger.

Freight and Transportation—Messrs. White, chairman; Clifton, and Innis.

Auditing—Messrs. Owen, chairman; Goss, and Pope.

Good Roads—Messrs. Waldon, chairman; Davis, and Bennett.

Legislation and Legal—Messrs. Bennett, chairman; Innis, and Pope.

Contest—Messrs. Waldon, chairman; White, Kittridge, Davis, and Pope.

Transcontinentalists Reach Santa Fe.

SANTA FÉ, N. M., March 7.—Our progress during the past week shows a marked improvement over former weeks, and if the roads continue good the wheels of the *Mountaineer* will be revolving over Colorado soil within the next two or three days with New Mexican adobe left behind forever.

In pulling out of Albuquerque we swung off from the railroad, and, with a Government survey map for a guide, headed directly across the prairie for Tijeres Canyon. The road surface was excellent most of the way. After passing through the canyon, the road led through the Mexican towns of San Antonio and San Antoneto, at both of which there were persons who knew enough English to direct us to the next settlement. Every time we reached an altitude of more than 6,500 feet we ran into the snow belt, and that usually meant mud.

The aroyos all through this section are deep, and would bring the car to an abrupt stop every time, were they not all bridged. Some of the bridges sagged and groaned under the unusual load, but nothing gave way and we made excellent progress.

As usual, we were handicapped to some extent by the fact that the standard tread in the East is not so wide as that used in the West. Everywhere west of Rock Island we have found the roads cut by wide gauge wagons, making it necessary for the Reo to make its own trail through the rough roadbed on one side, the wheels taking the wagon track on the other.

We had a rather thrilling experience coming over one range of mountains between Albuquerque and Santa Fé. While ascending a long, steep mountain pass with a

precipice of a hundred or more feet on one side and a rocky cliff rising to an equal height on the other, a small stone flew up and struck the sprocket in such a way as to snap the chain. Almost immediately the car started backward. Instinctively I put my foot on the brake, but as the chain was broken this had no effect. By the time I caught the emergency brake handle we were backing down the mountain much faster than we had come up. Standing on the emergency brake handle, steering backwards and looking over my shoulder at the trail was rather ticklish work, but I managed to stop the car before any damage had been done. To repair the chain was the work of only a few minutes, and we were soon climbing again, until finally the barometer read 9,025 feet.

At Golden, a little gold mining town, peopled with a bunch of New Yorkers—the gold mine is owned by New York capital—we found a very good hotel.

From Santa Fé we shall drive to Las Vegas, then through Colorado, Kansas, Missouri, Illinois, Indiana, Ohio, West Virginia, Pennsylvania to New York.

PERCY F. MEGARGEL.

In an interesting paper read before the London Society of Arts, Claude Johnson, the first secretary of the A. C. G. B. I., pointed out the fact that at the same time that Benz and Daimler were experimenting with internal combustion engines, 1885, an Englishman named Butler built and drove a gasoline engined bicycle. The authorities, however, forbade him, in their usual shortsightedness, to use his machine on the roads, and he therefore did not pursue his idea any further.

An Up-to-date Private Garage.

Private owners of automobiles have not yet provided garages for their cars that can compare with the magnificent stables built by owners of horses; but, nevertheless, a number of private garages have been built which are not only practical and convenient for actual use, but are well designed and



EXTERIOR OF THE CLEMSON GARAGE.

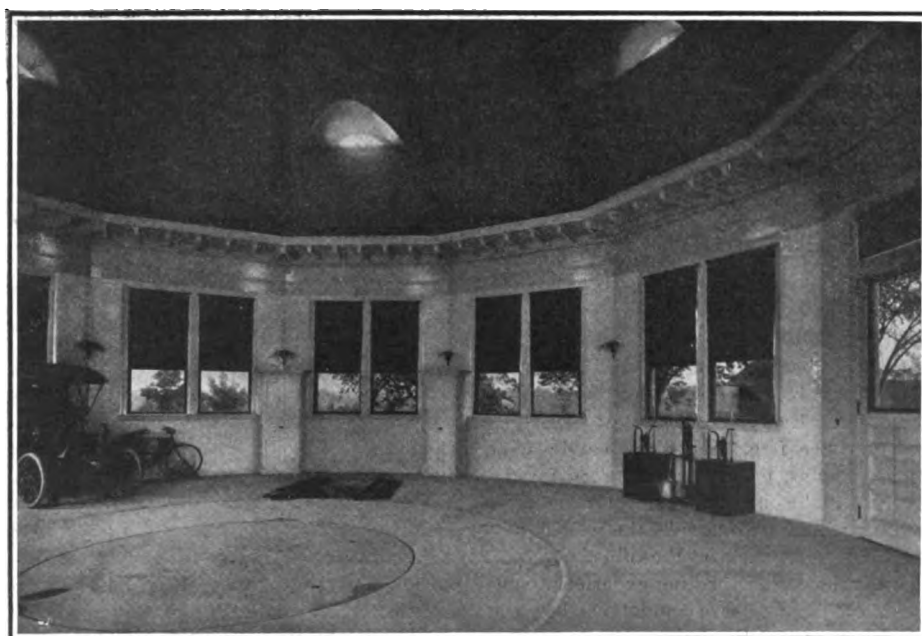
pleasing to the eye. The garage built for George H. Clemson, of Middletown, N. Y., is a good example of a private garage with plenty of space for the growth of the "string" of cars, convenience for handling, washing and working on the machines and having an ornamental exterior. The garage gives the impression of being circular, but is really polygonal; the roof is a cone with a cupola at the apex containing ventilators. Surmounting the whole is a weather vane appropriately formed to represent an automobile. Small windows in the roof add to the light admitted by the numerous large

windows in the walls. The exterior walls are of Warsaw bluestone and the roof of cypress shingles, stained green. The interior walls are of white enameled brick, which is easily kept clean and does not absorb light. The ceiling is plastered and canvassed and the canvas painted and decorated. The terrazzo floor has a turntable in the center, and there is a pit for convenience in getting at the under parts of cars. Between two angles, and directly under the windows, is a bench, and under the bench are tool cupboards, drawers, and so on. Cabinets with self-measuring pumps for gasoline and lubricating oil are placed close to the wall near the large double doors, and closets for hanging up clothing between the windows.

The garage was designed by Frank J. Lindsey & Son, architects, of Middletown, N. Y., and built under their supervision. It was finished about six months ago and is now in regular use by the owner.

The 20th Century Farmer.

VALPARAISO, IND., March 12.—Here is a piece of news that ought to bring a smile to the face of every autoist in the land. An Indiana farmer is an agent for an automobile—not only is he the owner of a "devil wagon," of which soil tillers are wont to say scathing things, but three of his farmer sons own and operate them, and now the father is spending much of his time in placing machines among the farmers of Porter county. The name of the farmer agent is L. H. Robbins, located at McCool, Ind., and he handles the Reo. Up to this time no less than fifteen farmers have bought and are running machines hereabouts.



THE INVITING INTERIOR OF THE MODEL CLEMSON GARAGE AT MIDDLETOWN, N. Y.

Albert Zimmerman, the only repair man here, will build a new garage this summer. There is quite an increase in sales of machines—two Buicks, a Pierce, and a Rambler have been bought here since the Chicago show. Twenty machines are now owned in Valparaiso. The town is on the line of a good road route from Chicago to Cleveland. Porter county is about to build a new gravel road to La Porte during the season.

A. L. A. M. Record of Sales.

Some interesting figures relating to the production and sales of automobiles in the United States during the last three years have just been brought out in the course of the litigation now in progress against certain manufacturers, dealers and users of cars alleged to infringe the Selden patent. M. J. Budlong, president of the Electric Vehicle Company, which is the plaintiff in all of the suits, was called to the stand in the United States Circuit Court to testify concerning the amount of business that had been transacted under licenses granted under the patent.

The following table summarizes the records kept by the licensors from figures furnished under oath by the manufacturers and given by Mr. Budlong in his sworn testimony:

Total number of cars sold under Selden license, Jan. 1, 1903, to Jan. 1, 1906.....	41,696
Total value of three years' sales, as above.....	\$63,141,437.22
Royalty on cars made under Selden patent license.....	\$814,183.52
Licensed cars sold in 1905, ..	17,840
Value of licensed cars sold in 1905	\$31,814,758.99
Increase in number of cars sold in 1904 over 1903	30%
Increase in gross value of sales in 1904 over 1903	58%
Increase in number of cars sold in 1905 over 1904	32.5%
Increase in gross value of sales in 1905 over 1904.....	66.2%
Average selling prices for 1903, approximately	\$1,170.00
Average selling prices for 1904, approximately	1,422.00
Average selling prices for 1905, approximately	1,784.00
Average selling price for three years, American cars, approximately	1,429.00
Average selling price for three years, imported cars, approximately	6,710.00

Thirty-seven concerns are now allied in the Association of Licensed Automobile Manufacturers, and it is claimed that their combined product constitutes a large majority of the cars made and sold in this country. This is the first time that such reliable and official figures have been furnished.

The European Circuit Will Start July 26.

PARIS, March 3.—Some modifications have been made in the arrangements of the European Circuit by the international conference representing France, Germany, Belgium, Austria and Italy, which recently met at the Automobile Club of France.

Instead of commencing on July 29, the date of the contest is now fixed from July 26 to August 15. This gives a twenty-one days' event, including five exhibitions at Toulouse, Milan, Vienna, Berlin and Cologne. The tour will include some long runs, the longest being from Paris to Limoges, and some difficult mountain climbs in the passage from France to Italy.

On the opening day 244 miles will be covered. The fourth stage, Grenoble to Milan, including the ascent of Mount Cenis, is 250 miles. Vienna to Prague gives 162 miles of bad road; from Berlin to Breslau is a distance of 190 miles, and from Berlin to Hanover there are 186 miles to be covered. From Hanover to Cologne gives 234 miles, and from the city of smells back to Paris is 250 miles.

When it is remembered that a class is provided for cars of about 8 horsepower, and that many of the roads are hilly and of

bad surface, it is not surprising that manufacturers hesitate to enter for the tour. Too high an average speed also is being imposed. Twenty-nine miles an hour—all stops being counted in the running time—is beyond the capabilities of nine-tenths of the touring cars over such roads.

It had at first been proposed to place a commissaire on board each car, but owing to the objection of several probable competitors, as well as the difficulty of finding sufficient suitable men, this measure was abandoned by the conference.

Sub committees were appointed to deal with the various details of the tour, such as tires, timing, weighing-in, classification, the press and exhibitions.

A special train will be run during the European Circuit, by means of which pressmen and others interested in the event may follow the competition through Europe. Meals will be served on the train and special sleeping accommodations provided, making the train virtually a traveling hotel.

Engagements for the tour are now open, and in a few days it will be seen whether the contest will fulfill the expectations of its promoters.

and in the woman with extended arms, full of the *joie de vitesse*. The great artist dilated with seeming relish on the fact that although in no way a sportsman—"and that's where the joke comes in," he quaintly stated in parentheses—his name is now so closely coupled with a sporting event "that even the Munich critics, who so badly wanted to unfavorably criticise my works exhibited at Munich at the same time as the Trophy week, didn't dare to—I was too popular!"

Entries for Monaco Meet.

PARIS, March 3.—The entry list for the Monaco auto boat meeting, which opens April 1, shows a total of 94 boats, of which 61 are cruisers, 8 ships' boats and fishing craft and 25 racers. France has entered 36 of the cruisers and 12 racers. Italy and Switzerland have each 6 cruisers, while other nations are represented by only one or two each. England has entered 5 racers.

As in previous years, the meeting will be opened by an exhibition of the boats in a specially prepared open-air display ground, followed by one week's racing.

One of the most notable of the French racers is *Antoinette IV*, engined by Levassieur and hull by Pitre. Baron de Caters has entered an 8-meter boat named the *Seasick*, the hull of which was built on the Seine and fitted with engines by the Itala company. Another Itala boat, with a French hull, is entered by Vincenzo Florio.

Four Mercedes craft will be at the starting line, two of them with French and two with English hulls. The *Trefle à Quatre* and the *New Trefle*, both owned by the English sportsman, Mr. Thubron, represent Brasier motors; Dietrich has engined the big 15-meter *Dubonnet*, hull built on the Seine by Tellier, and the Fiat colors will be carried by *Fiat XIII*, entirely of Italian construction. Panhard and Levassor, Martini, Hotchkiss and Delahaye have each engined one racer. Two steamers figure among the racers, the Italian *Roggero I* and an English boat owned by Lord Howard de Walden.

FOREIGN RACING NOTES.

The "Coup de Turin," which was to be run off as a speed race, has been postponed till 1907, as a suitable track could not be found near Turin.

* * * *

Only a single entry for the tire race organized by the Automobile Club of France had been received when the entry list closed on February 15. Upon payment of double entry fees, however, additional contestants may enter up to May 15.

* * *

A 400-mile speed race from Barecolna through Saragoassa to Madrid will form one of the features of the celebration of the marriage of the King of Spain.

An Englishwoman's Herkomer Tour Experiences.

LONDON, March 8.—The Ladies' Automobile Club, G. B. I., had a most interesting afternoon, when Mrs. Edward Manville, the only woman driver in last year's Herkomer event, gave an amusing review of her experiences during the tour. Talking of her journey to Munich, Mrs. Manville said:

"Running into the Munich control was quite an ordeal; ever so many royalties were collected there, and when I made my appearance the people cheered, a band played our national anthem and the club presented me with a most magnificent laurel wreath tied up with Bavarian ribbons.

"The next day we were all invited to the Palace of Prince Ludwig of Bavaria, and I was presented to the Princess and to him, and he then made a point that I should go to the banquet which was to be given that night to the owners and drivers of the cars. Just imagine being the only woman among 270 men; but I could not get out of it after Prince Ludwig's request.

"I wonder if any of you have ever been to a German banquet—it is so funny. The speeches come between the courses, so that it takes a very long time to get along with the dinner. It was hors d'œuvres, then a toast to the German Emperor, soup, Prince Henry of Prussia, fish, and to my horror, Mrs. Manville. I wondered what I was to do to acknowledge it—my husband was ever so far away—but Prince Ludwig himself solved my difficulty by "protesting" with me, that is clinking glasses, immediately after

my health had been drunk. Then every man in the room did likewise."

Talking of her further tour, Mrs. Manville, relating two comical frontier experiences of the five Daimlers forming the British caravan, said:

"Of course, we had no end of frontiers to pass with all this dodging about, and it was often a difficult problem for the officials to find enough money to pay us off as we left a country. On one occasion it could not be managed, and I do not know exactly what he had to do, but the gendarme took us to another place, where he got the money. He dare not leave the cars until they had passed the frontier, where stood the man with the gun, so went two miles with us to the next country, and waited to see us over the boundary, and then had to walk two miles back in the pouring rain. At another frontier we had a funny experience of red tape. My husband happened to stop his car with the two front wheels in Germany and the two back ones in Switzerland, and the officials would have nothing to say to him until he had backed the whole car into Switzerland."

On the conclusion of the lecture, Professor von Herkomer, who was one of the club's guests, explained in a few witty words the meaning he had expressed in the trophy. The joy of movement, the absolute delight in the thralldom of the onward motion is represented in the figures of Mercury, most progressive and unconventional of gods,

AUTO DRIVE, STEERING, AND SKIDDING.

By L. M. DIETERICH, M.E.

STEERING systems for power-driven vehicles present a subject for comparative study which contains more interesting matter than might be considered probable on first thought.

The condition under which these devices have to be operated are so numerous, and the subject so interconnected with other problems of automobile design, that the material for the study of their connection with other parts of the running gear consists of a number of statistical facts, the comparison of which reveals several conditions for the arrangement of the steering elements of an automobile which hitherto have seemingly found little consideration.

Strictly logical calculations, guided by the knowledge of practical results, may then develop rules touching general principles, as also defining conditions which should prove of material assistance to the designer and builder.

Taking a four-wheeled vehicle into consideration, we have the first condition for the possibility of automobile steering given by the method of the structural attachment of the wheels to the frame of the vehicle.

These methods are in close alliance with the drive of the vehicle, and the following examples embrace all the possible combinations:

1. All four wheels steering wheels. (As steering wheels such road wheels are understood which are capable of an angular throw of equal magnitude to both sides of their normal position and pivoted on a vertical axle, as near as possible to the center of the wheel. For the following discussion all steering wheels are assumed to possess the same maximum amount of such angular throw.): (a) front wheels driving, (b) rear wheels driving, (c) front and rear wheels driving.

2. Front wheels steering wheels, rear wheels of permanent position, parallel to longitudinal axis of vehicle: (a) front wheels driving, (b) rear wheels driving, (c) front and rear wheels driving.

3. Rear wheels steering wheels; front wheels of permanent position: (a) front wheels driving, (b) rear wheels driving, (c) front and rear wheels driving.

For every one of these possible combinations it is natural that the one condition must be fulfilled which calls for the position of wheel planes tangential to the path of the wheel center, as shown in Fig. 1, and not in the exaggerated position shown in Fig. 2, which naturally would prevent true rolling of the wheel and thereby destroy its essential functions. As the four wheel centers or wheel pivots are in unalterable relatively fixed position, they must

follow any path of the center of gravity of the vehicle in parallel or in concentric curves.

This condition with the previous one combined establishes the rule that all four wheels must constantly have such relative angular positions that their geometrical axes meet in one point. This rule being an accepted detail of automobile design, its theory needs no further discussion.

Combination 1c, 2b and 3a are not only theoretical possibilities, but in practical use, and therefore the best representatives of their classes for critical observation.

Taking up combination 1c, four-wheel drive and steering, Fig. 3 shows one ar-

of higher driving efficiency than the front wheels. It would be mechanically correct to have all four wheels of the same driving efficiency.

The propelling power of the front wheels f_1 , f_2 , give a drive resultant dr_1 for the front axle, which, combined with the drive resultant dr_2 of the rear axle, form the drive resultant DR for the center of gravity. As seen in Fig. 3 this lies in the center line of the vehicle.

The path of the center of gravity being prescribed by the paths of the four wheels is not tangential to the center line of the vehicle. As a result, we find that the driving force of DR splits into an actual

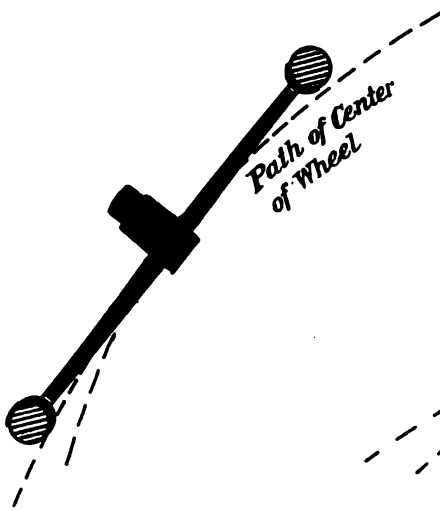


FIG. 1.—WHEEL PLANE TANGENTIAL TO PATH OF WHEEL CENTER.

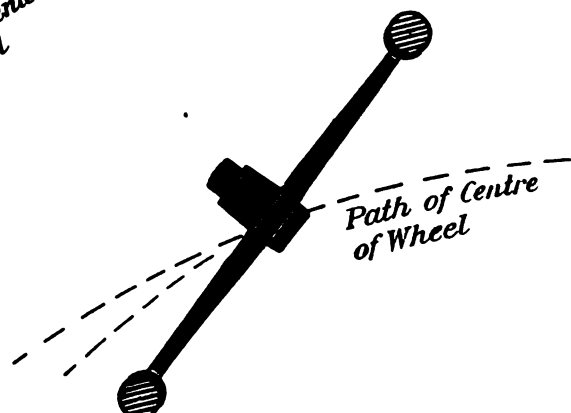


FIG. 2.—PLANE OF WHEEL AT ANGLE TO PATH OF MOVEMENT.

range of this combination executed in a touring car design in which the center of gravity usually does not coincide with the geometrical center of the four wheel centers or steering pivots, but is located to the rear of same.

Steering connections between the four wheels were so arranged as to give the correct result indicated in Fig. 3 of all four wheels in tangential position to the path of their respective centers. The maximum angular throw α creating a minimum turning radius R for the center of gravity CG , which is for the loaded vehicle in its usual location behind the geometrical center of the wheel centers as indicated by the intersection I of the center line CL of the vehicle and its normal N from the turning center C .

As all four wheels are intended to transmit the same power or propelling force by virtue of their actual contact with the ground, we find from the location of the center of gravity that the rear wheels are

propelling force PF , tangential to the path of the center gravity, and a skidding force SF nearly normal to the center line of the vehicle. Its direction is fortunately opposite to that of the centrifugal force of the center of gravity, and therefore without practical influence on the wheel ground contacts on which it would otherwise (especially regarding the rear wheels) have a disagreeable skidding effect. The apportioning of this skidding force in four components to the four wheel centers results in accelerating forces for the front wheels and retarding forces for the rear wheels, nearly counterbalancing each other and skidding forces with the mentioned characteristics, making them practically negligible.

Combination 2b (Fig. 4) is the generally adopted arrangement of front wheel steering and rear wheel drive. In the same we find all four wheels tangential to their respective parts, which is correct, but the maximum angular wheel throw α , creating a minimum turning radius R —of double the

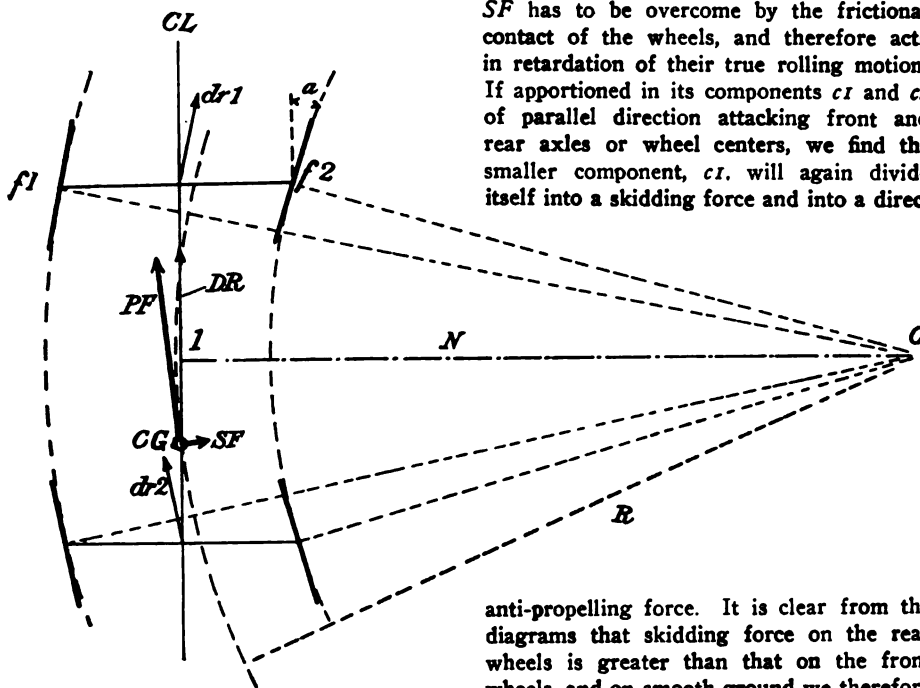


FIG. 3.—DIAGRAM SHOWING FORCES ACTING ON A FOUR-WHEEL-DRIVING, FOUR-WHEEL-STEERING VEHICLE WHEN TURNING A CORNER.

value of that in combination 1c—for the center of gravity CG , which has its usual location in the rear of the geometrical center of the four wheel contacts, but in front of the intersection I of the center line CL of the vehicle and its normal N from the turning center C , which coincides with the centerpoint of the rear axle. The rear wheels alone propelling the vehicle, the driving resultant dr is equivalent in power and direction to the final driving resultant DR of the center of gravity.

The center line of the vehicle not being tangential to the path of the center of gravity, the driving resultant DR divides into the effective propelling force PF and the skidding force SF , which is, unfortunately, not counteracted by any centripetal force exerted on the turning vehicle. This force

anti-propelling force. It is clear from the diagrams that skidding force on the rear wheels is greater than that on the front wheels, and on smooth ground we therefore find the car turning round its own center in the same sense as the intended turning motion of the vehicle.

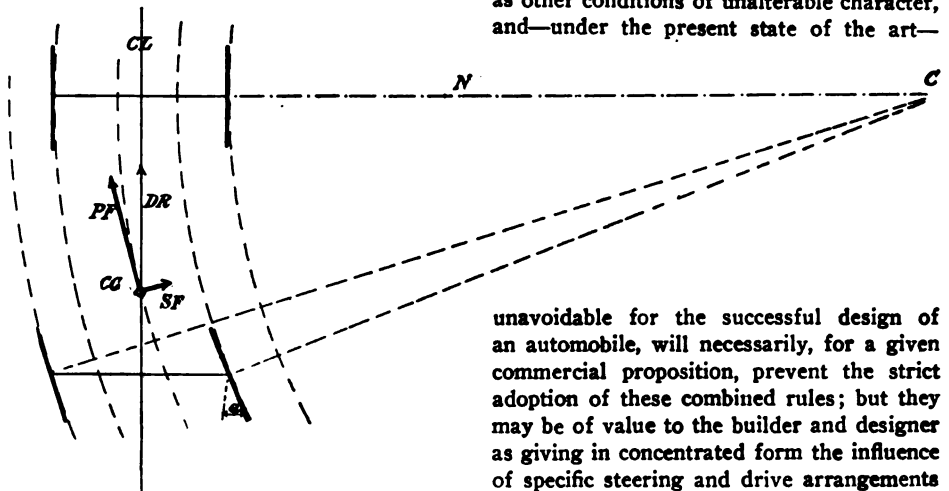


FIG. 5.—DIAGRAM SHOWING FORCES ACTING ON A FRONT-DRIVING, REAR-STEERING VEHICLE WHEN TURNING A CORNER.

Combination 3a—as exponent of the rear wheel steering class with front wheels driving—forms the next subject for the critical study of drive and steering arrangements. Proper steering connections again give the desired effect of wheels

tangential to their center path. In Fig. 5 the maximum angular throw a results in a minimum steering radius equal to that of front-steering rear-drive and double the steering radius of the four-wheel steering and drive combination.

The location of the center of gravity nearer the rear axle is upheld to maintain similar conditions for steering conclusions, but will, with a front drive arrangement, probably be located further forward, which is also desirable on account of its effect of increasing the tractional efficiency of the driving wheels.

The graphical study of the remaining forces, similar to that given in the previous cases, results in a propelling force PF and a skidding force SF , with retarding influence on the rear wheels and otherwise in opposite direction to centrifugal tendencies.

The graphical study of the remaining six combinations previously referred to gives similar results which can be—for space limitation's sake—eliminated, as their distinctive features are embodied in the three combinations already explained.

The following conclusions, permissible as theoretical suggestions, are by no means conclusive in the form of practical rules, as other conditions of unalterable character, and—under the present state of the art—

unavoidable for the successful design of an automobile, will necessarily, for a given commercial proposition, prevent the strict adoption of these combined rules; but they may be of value to the builder and designer as giving in concentrated form the influence of specific steering and drive arrangements regarding tractional efficiency, turning capacity, skidding, and smooth steering.

But there is one discord between the combination of the usual steering arrangement and the usual location of the center of gravity. If the center line of the vehicle were represented by a tangent on the path of the center of gravity, no skidding forces would appear, and the driving resultant would be propelling force in its full amount.

Fig. 4 shows this an impossibility for front-steer rear-drive, as it would necessitate the location of the center of gravity in the center of the rear axle.

Fig. 5 shows it an impossibility for front-drive rear-steer, as it places the center of gravity in the middle of the front axle. For a four-wheel steering arrangement it is a possibility even without in the least disturbing the location of the center of gravity, as shown in Fig. 6, and which means only the different proportioning of relative dimensions of steering connections for front and rear axle. It slightly increases the

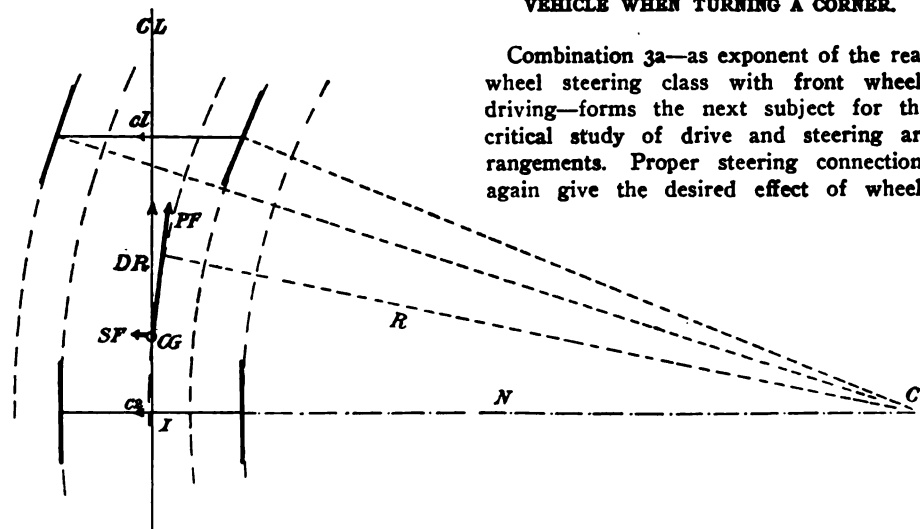


FIG. 4.—DIAGRAM SHOWING FORCES ACTING ON A FRONT-STEERING, REAR-DRIVING VEHICLE WHEN TURNING A CORNER.

minimum turning radius by moving the normal N from its symmetrical position. Including well-known facts for the sake of completeness, we arrive at the following conclusions:

First: From a viewpoint of steering efficiency only, the four-wheel steering permits of quicker turning than either front or rear-wheel steering, which is especially desirable with long wheelbases and valuable for commercial vehicles, especially facilitating maneuvering in small space and the ready approach to curbs.

Second: From a viewpoint of driving efficiency only the four-wheel drive is su-

Seventh: A rear-steering front-drive arrangement should have its center of gravity as near as possible to the front axle. It creates in itself no skidding forces of dangerous character.

Eighth: The most advantageous features of all combinations are from a practical point of view combined in a front drive, four-wheel steering with center of gravity as near as possible to the front axle.

Electric Charging Plant.

An unusually complete charging plant for electric automobiles has been installed in the new garage of the Cook & Stoddard Company, of Washington, D. C., where about one-third of the total floor space of 10,000 square feet on the ground floor will be given up to electric machines, the remainder being devoted to gasoline cars. As the available current supply is of the alternating kind, some means must be provided

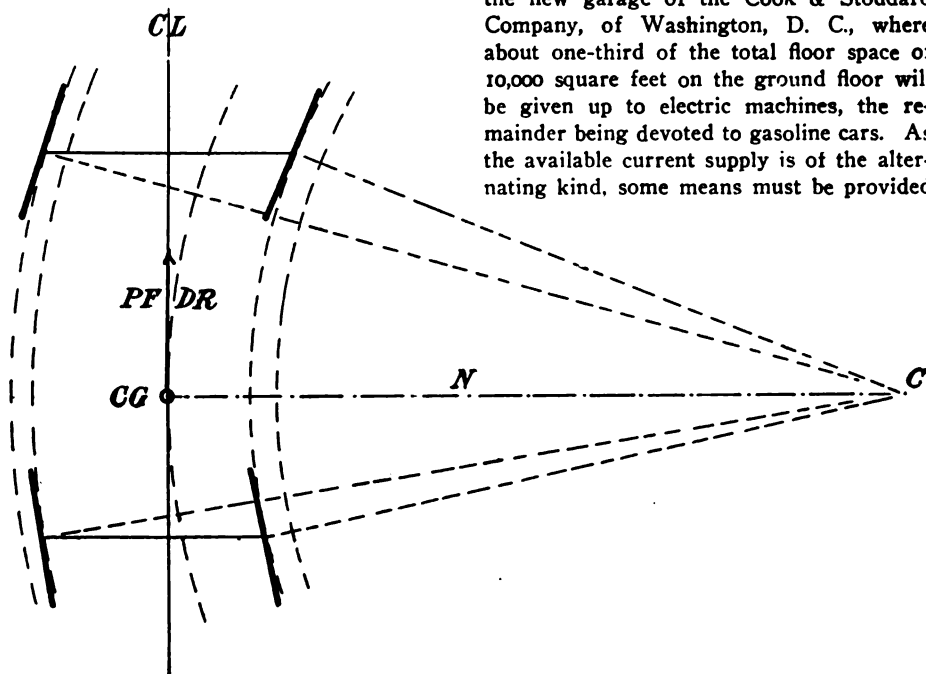


FIG. 6.—DIAGRAM SHOWING AN IDEAL CONSTRUCTION OF FOUR-WHEEL-DRIVING AND FOUR-WHEEL-STEERING VEHICLE ON WHICH NO FORCE CAUSING SKIDDING IS EXERTED WHEN TURNING A CORNER.

perior to either front or rear-wheel drive, as the whole tractional friction of all four wheels can be used with an approximate proportion of 100 per cent. to 60 per cent.

Third: The four-wheel steering arrangement is the only one that will not create any skidding or appreciable retarding forces if the center of gravity lies in the intersection of the vehicle center line and its normal from the turning center.

Fourth: If the center of gravity can coincide with the geometrical center of the four-wheel centers these advantages are maintained, and even traction for all wheels and possibility of following ruts (Fig. 3) is added.

Fifth: Special conditions have to influence the decision if these advantages are desirable under the necessary complication, which is not prohibitive in character for the steering action alone, but somewhat serious for the flexible drive.

Sixth: For a front-steering rear-driving arrangement tractional efficiency is increased and skidding decreased by moving the center of gravity as far as permissible to the rear.

for obtaining a direct current—the only current that can be used for battery charging. For this purpose five mercury arc rectifiers have been installed by the General Electric Company, of Schenectady, N. Y. The operation and construction of this type of apparatus was described in detail in *THE AUTOMOBILE* for December 14, 1905, so that further description is unnecessary here. Each of the charging units has a capacity of forty amperes, and is so arranged with regard to terminals that from one to ten vehicles can be charged simultaneously from each rectifier, the maximum number depending upon the capacity of the batteries. Any number up to ten can be handled simultaneously as long as the aggregate does not call for a load in excess of the capacity of the rectifier—that is, forty amperes. Any one battery can be disconnected without breaking the circuit and interfering with the charging of the remaining batteries. Electrical measuring instruments are arranged so that the batteries will each charge at the proper rate; the total direct current voltage and the total alternating current voltage are also indicated by the appropriate instrument.

A Rubber Plant in Colorado.

Colorado's arid sections which have been given over to the sage brush, cactus, and rubber weed, says the *Denver Post*, are to prove one of the resources of the State, and besides adding heavily to the wealth of the farmer and manufacturer, will assist in supplying the rubber found so necessary in these days of automobiles and bicycles.

E. C. Dunbar, manager of the P. F. U. Rubber Company of Durango, has just returned from Washington, where he secured the aid of congress and the agricultural department in taking the first step toward making Colorado one of the world's centers for the supply of rubber. This first step consists in the granting of a ten-year lease on 5,534 acres of land in the vicinity of Durango. This land will be used as an experiment station and the secretary of agriculture has assigned two experienced plant men and a chemist to assist the rubber company in propagating and securing enough seed to distribute to the farmers, so that a large amount of the rubber plant can be raised.

"The pinguay or rubber plant thrives better on this piece of land we have selected than in any other place we have been able to discover in the state," said Mr. Dunbar, who was in Denver for a few hours on his way from Washington to the scene of his future labors, the model rubber-weed farm, twelve miles southwest of Durango.

"We have experimented with the wild rubber weed, and now our efforts will be to cultivate the seed of this plant and go about the systematic cultivation of it so that a supply to run a large factory can be assured us. On this tract of 5,534 acres, on which we have secured a ten-year lease with the privilege of buying it at the expiration of that time, if we can assure the federal government that our work in this line has been worthy of consideration, we will plant the wild rubber seed. We will cultivate part of it under irrigation. Another portion will be left to absorb only the natural moisture, and other portions will be experimented with in different ways.

"The industry is in its infancy, but we feel assured on the strength of calculations we have made that there is little possibility of failure. The rubber weed, for the plant is nothing but a weed, will yield about three tons to the acre in three years, or about one ton a year. This raw product brings in a return of about \$30 per ton, and can be grown at an annual expense of about \$10 per acre. About 10 per cent. of the gross yield is the rubber gum used in the manufacture of rubber goods."

Before taking the car out of "cold storage" and filling up the tanks for the first time, be sure that none of the pipes are clogged. The lubricating oil pipes are apt to be clogged with oil and there is also a possibility of the gasoline pipes and the circulating system being partly stopped up.

French Runabout and Tri-car Touring Contest.

PARIS, March 1.—The French touring program which finished 1905 with an interesting six-days' endurance test for runabouts has opened in 1906 with a similar event. From the Darracq factory at Sur-esnes, on the border of Paris, has been sent away every morning three small cars—known here as *voiturettes*—and five tri-cars, on a daily run of about 130 miles. The tri-cars were represented by one Bruneau, two Austral, one Griffon, and one Quentin, while the runabouts consisted of two Grégoire cars and one Vulpes.

The route for each day's run was made known only at the moment of starting, the drivers being given maps of the course to be covered. The legal speed limit of 19 1-2 miles an hour was imposed, all repairs, fitting of tanks and regulating to be counted in the running time, and one penalty point was imposed for every minute or fraction of a minute slower than the average. No speed above 19 1-2 miles an hour was counted.

Rain, wind, snow and frost followed one another in quick succession, and before five miles had been covered drivers and cars were unrecognizable under a thick coating of mud. French roads are generally considered good, but under such climatic conditions no highway could offer a good driving surface. In the immediate neighborhood of Paris, especially, the highways were execrable and the fore wheels of the tri-cars plowed through the mud, sinking sometimes to the axles in the gluey mud. The last day's run, to Chartres and the Chevreuse Valley, was made in a gale of wind and rain that was particularly disagreeable for the light tri-cars.

The final result was first position for the Grégoire small car, driven by Civelli de Bosch, who had covered 750 miles in six consecutive days with but 233 points against him. This gives a loss of but 3 hours 53 minutes on an imposed speed of 19 1-2 miles an hour over bad roads in mid-winter. In reality the loss is less, for on several occasions the car arrived at the control before official opening time, but this increase of speed was not allowed to counterbalance a loss on another day.

Barriaux, on a Vulpes, came in second with 457 points against him. But for an accident his position would have been much better, the car having run throughout with remarkable regularity. Grégoire II, driven by Cornit, occupied third position with 1,576 penalty points.

Of the tri-cars, a Griffon driven by Bucquet, secured first place, with 787 points; a Bruneau tri-car occupied second position, with 1,298 points, and an Austral took third place, with 1,414 points.

The performance of the tri-cars is really more worthy of mention than that of the larger vehicles. An average of 19 1-2 miles an hour is a respectable speed to maintain

over a 750-mile run, and it is surprising that the penalty points are so low. More protection against mud is needed to make these vehicles suitable for all-around work, as was proved by the performance of the Bruneau tri-car, which took second place. With the smallest cylinder of the lot—2 1-2 horsepower—it made the runs with more regularity than any of its competitors, thanks to an enclosed chain drive and protection for the engine. Position was lost solely through an insufficiency of power to travel at the rate demanded.

From Motordom's Capital.

PARIS, March 2.—French automobile exports for the year 1905 are given in the bulletin of general trade at \$20,053,000. Separate figures of the automobile industry have only been kept since 1897, and are as follows:

1897—\$124,738.	1902—\$6,046,200.
1898—\$349,870.	1903—\$10,167,400.
1899—\$851,866.	1904—\$14,007,000.
1900—\$1,883,400.	1905—\$20,053,000.
1901—\$3,156,400.	

The competition for a speed and distance indicator, for which a prize of \$200 is offered by Baron Henri de Rothschild, will be held May 1 and following days, engagements being received by the Automobile Club of France up to April 15. Entrance fee is fixed at \$10. In addition to a written description of the apparatus, each competitor must fit his speed indicator on an automobile and submit to a 100 kilometers test run, as well as a test at the laboratory of the Automobile Club. The indicator will be examined four times during the run, and the laboratory trials will deal particularly with the accuracy of the clock. Points to be considered in awarding the prize are: Precision, facility of installation, regularity, and strength, weight of the apparatus and its price when fitted to the car.

Scottish Club Trials in June.

LIVERPOOL, March 1.—The reliability trial conducted by the Scottish A. C. in May of last year was probably the most severe, and at the same time the most successful, event of the kind yet held in Great Britain. The rules governing this year's trial, to be held on June 13-16, have just been issued. The main idea underlying the rules is that the contest shall be a test of reliability, and no advantage can be gained by speeding in excess of the scheduled rate between the various stopping places. An important variation between the conditions of this and the former trial is that an absolute non-stop run is not now a necessary condition in obtaining an award. This provision has been made in view of the fact that last year several cars spoilt otherwise clean records by momentary driving stops, such as in gear-changing or taking on petrol.

The trial is open to motor vehicles of all makes, but all drivers must be registered by the Scottish Club or the A. C. G. B. I. Only one car of any specific make, type and horsepower will be admitted in each class, no cars of the same make being considered as of different horsepower unless the cylinder capacities vary by at least 15 per cent. The following classes are arranged:

A. Petrol vehicles, selling price of chassis not exceeding \$1,000.

B. Petrol vehicles, selling price of chassis exceeding \$1,000, but not exceeding \$1,750.

C. Petrol vehicles, selling price of chassis exceeding \$1,750, but not exceeding \$2,500.

D. Petrol vehicles, selling price of chassis exceeding \$2,500, but not exceeding \$3,250.

E. Petrol vehicles, selling price of chassis exceeding \$3,250.

F. Steam cars, irrespective of price.

No petrol car showing more than 12

horsepower on basis of following formula shall have a seating capacity of less than four:

$$H.P. = \frac{(\text{Dia. of cylinder in ins.})^2 \times (\text{No. of cylinders})}{8}$$

The trial will be practically a non-stop run, as the only stops not causing loss of marks are compulsory, excepting stops for tire troubles not exceeding one hour in all, and five minutes allowed each day for adjustment of brakes.

The club will award an efficiency gold medal in each class, marks being allotted for reliability (800), hill climbing in timed test (100), and lowness of fuel consumption (100).

The course extends over a distance of 670 miles. On the first day the run is from Glasgow, via Dumfries, to Edinburgh; then on the second day Aberdeen is the destination. From Aberdeen the course lies west to Pitlochry, right in the heart of the Grampians, while the fourth day's run finishes up in Glasgow.

This trial will without doubt arouse much public interest, and the publicity obtainable by participation therein might well induce some American motor manufacturers to enter cars.

The financial results of the Berlin show from February 4 to 18 reveal a decrease of about 2,000,000 marks (\$500,000) from the receipts of the 1905 show, in spite of the fact that this last Berlin exhibition was the largest and best attended yet held in Germany. The threatened motor tax and liability law are the cause of slack business and the chief sales market of the year has been a vast disappointment, as people will not buy until they know how they stand with regard to the government measures.

Automobiles in Russia.

IN her present state of internal disturbance automobilism cannot be expected to make much advance in Russia; it is not improbable, however, that the revolutionary agitation may signalize a general awakening of the whole Russian nation that in the near future may open a greatly increased market for all kinds of industrial products of the Western nations, including automobiles. In Russia the natural conditions are at once favorable and unfavorable to the sale of automobiles. While the long winters, intense cold, absence of attractive scenery and the wretched roads are against the common use of autos, the conditions in the cities, on the contrary, point to the probability of a considerable use of such vehicles later. The slowness with which street railways are built forces many families to keep carriages. These will doubtless turn to automobiles. The only serious obstacle to a rapid development of the automobile trade in the large cities is based on police supervision and regulation. Now that a great change has come over Russia's police and other policies trade in automobiles may develop unmolested. The different cities, however, have each their own ways of handling the automobile traffic. St. Petersburg and Moscow long since recognized the automobiles as a necessity, hence their regulations are comparatively liberal. Riga and other cities have been rather severe. In those places certain streets may not be traversed by the autos. Applications in writing for permission to use an automobile must be made and the machine must be subjected to expert investigation.

NUMBER OF MACHINES IN USE.

There are in use at the present time in Russia, including Poland, the Caucasus and Finland, from 1,200 to 1,500 automobiles, mostly of the lighter types; and in addition there are fully 1,500 motorcycles. The demand for automobiles is almost certain to grow as the empire emerges more and more from a mere agricultural country to a position among the industrial and commercial states.

Nobody has done much about building automobiles in Russia. A St. Petersburg firm that built motor boats tried its hand at the automobile. Another firm is now doing what it can to introduce the manufacture of autos on the basis of a well-known American make; also one resembling a well-known German type. During the season of 1905 this firm turned out thirty machines. The warm weather is practically the only time during which the automobiles may be run in Russia. Some firms buy all the parts abroad, limiting themselves to the work of putting them together.

EQUIPMENT REQUIRED.

A writer in *Handel und Industrie* says the peculiar needs of Russia in regard to autos has never been met. The comparatively great success of the American type,

he thinks, was due to cheapness, abundance of supply, skillful advertising, etc. Simplicity of construction and driving are the prime requisites. The simpler the machines the better. If a machine is ever built to meet Russian ideas, it will have to be strong, so as to go safely over bad roads. Great speed is not required because of the danger from bad roads. Low speeds are wanted because of steep hills and bad places that require the machines to go slow. The springs must be stronger and longer when possible than they usually are. They should be provided also with shock absorbers. Strong axles and crankshafts are desirable; in fact, are practically indispensable. Only large-sized pneumatic tires will be acceptable on the wheels. The road clearance must be considerable, so as to avoid shocks from obstacles. The gauge or distance between wheels must be somewhat narrow, because of the narrow, almost pathlike, roads over which the machines have to pass, particularly in the country. (The 4 1-2-horsepower De Dion is said to be a suitable standard for Russia's roads.) It must have springs, brakes, etc., for the hills. The water-tank must be easy to empty in a short time and to the last drop, to prevent freezing. For the same reason the carbureter must be able to take up warm air. The machine must be as noiseless as possible. For trips into the provinces the only machines that are worth anything are those that carry a large supply of gasoline and have magneto ignition, for supplies may not be easily renewed and batteries cannot be obtained or recharged. The seats should be wide and comfortable, and the machine should have a top covering to guard against wind, sun and rain.

SIZE AND PRICE.

Russia is rich only in resources. Her people have no such huge sums as Americans and others to put into luxuries like automobiles. It is only by duly recognizing actual conditions that merchants and manufacturers seeking outlets for their goods in Russia will be able to realize fair, never fabulous, profits. First-class goods go fairly well only in large cities like St. Petersburg and Moscow. For these fairly large prices will be paid, as there are persons in those cities to whom \$4,000 or \$5,000 mean no more than to people in the large cities of the United States. One thing is possible, and for that all parties seeking sales in Russia must be prepared, viz., a demand not only for credit, but for long periods of credit. In the automobile business cash payments have prevailed in the past simply because the purchasers have been persons of great or considerable wealth. The best-informed parties say that the machines that will sell best will run between \$1,000 and \$2,000 apiece.

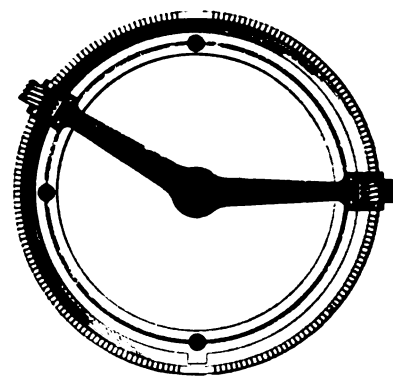
The United States will have to meet French and German makers in Russia's

markets. At present American makes are the favorites. This the Germans admit.

Following is a list of firms in Russia dealing in automobiles: St. Petersburg: Automobilclub, Nevsky, 108; "Pobjeda," Tanski & Co., Moika, 61; Freese & Co., Ertelev Per., 10; A. M. Fokin, Troizka; Emil Braun, Kamennostrowsky Pr.; "Polytechnik," "Troizkaja; Hoffmann, Kleine Dworjanskaja, 19. Moscow: Automobile Club, G. Schemlitschka, Mjassnizkaja; Aktien Gesellschaft "Dux"; "Express" Neckarfulm, Banzhaf & Co.; Handelshaus Pochilsky, Twerskaja; Aktiengesellschaft "Enfield," Roshdestwenskaja; I. Block, Kusnezky Most. Riga: A. Leutner & Co., Alexanderstr., 129. Odessa: M. Anach, F. Zorn & Co.; A. Reno; J. Glats & Co. Saratof: R. Ehrt. Warsaw: International Automobile Agency, Leschno, 25; Kowalsky & Trylski, Mjodowa, 4; Maison Ormonde; B. Wahren. Kief: E. Torkler. Kharkof; S. L. Popow, Usowskaja, 9. Novorossisk: F. Burkhardt & Co.

Control Sectors.

A new sector, known as the Penau, was shown at the Paris Salon for ignition and throttle levers on the steering wheel. The two levers from the center of steering wheel are of flexible steel and bear at their ends worm screw gearing with the teeth on the upper surface of the sector. Owing to their flexibility, the levers can be readily raised so as to be pushed round rapidly in either direction, quite independent of the gearing,



PENAU CONTROL SECTORS.

or they can be worked round slowly by the finger and thumb, with the greatest precision and without fear of their being disarranged accidentally. They are made for both automobile steering wheels and for motorcycle sectors.

Persistent rumors are abroad to the effect that a trust will shortly be formed, to comprise all the important Italian automobile establishments, such as Fiat, Itala, Bianchi, and Gortha Fraschini. No confirmation of this can yet be obtained, though in Parisian automobile circles the trust is not regarded as improbable. In view of the enormous progress which has been made by Italian firms during the past two years a combination of this nature would be immensely powerful and would probably result in lower prices for high-grade machines.

Autoing in the Ottoman Empire.

By FELIX J. KOCH, M.B.

IF someone had the nerve to risk Macedonia, which is to say, to ride over roads that would give a road commission heart throbs, and to take along a liberal supply of firearms—just enough to keep

that four times a day he goes to the fountain and washes hands, feet and face before he says his prayers. Kindly to the stranger, and with all the inquisitiveness of the East in his soul, he will leave his seat at the edge

Out from Sarajevoan to the Sandchak of Plevna the roads are patrolled for the mailstage, and with a good mountain highway and splendid scenery the excursion is strongly to be recommended.

Autoing in Turkey would have its charms other than scenic alone. At intervals, along the roads, are the *hans*, or inns, where they will slaughter you a lamb, set it on a pole



SCENE IN ONE OF THE WELL-PAVED CITY STREETS.



A GALLERY IN ONE OF THE INTERESTING OLD TURKISH MOSQUES.

away brigand bands—he would be likely to have as unique an autoing tour as any in the world.

Of course Turkey is interesting, and, in places, beautiful.

Southern Macedonia, out from Salonica, is the artist's paradise. Ancient cities, old when the Christ was born, rise up, pink and yellow, red and blue, with spires and minarets, and long quays set out into the sea. About the town old walls extend, and

of the bazaar to look over the queer, horseless carriage and finger this or that.

Much as the Turk has been blasphemed at home, he is really a genial host and one need have little fear of traveling in his villages, or with him as guide.

The Bulgar and the Greek, however, are other parties. They, each in turn, are looking to the time when Abdul Hamid falls and all Macedonia will become part and parcel of Bulgaria or of Greece. And, in

fitted with a paddle-wheel turned by the nearest brook, and, while the roast browns delicately, your host gathers the long, narrow egg plant of the region and a few peppers and boils these both to a mushy consistency. Then there may be some *sli-vo-witz*, or prune brandy, and the meal is complete. While you eat he serves you and interviews you on the queer land across the seas, of which he has but dim concepts, and of your trip and your garments, for every-



MINARETS AND NARROW WALKS TYPICAL OF TURKISH CITIES.



BULGARIAN TYPES THAT ARE TO BE FEARED BY THE TOURIST

then, beyond, there stretches off the fertile rolling land of Macedonia.

If only to penetrate the streets of cities Turkey is interesting. Folk of all nations are here, and each in distinctive costume. There is the Turk, not dirty and swarthy—as we, judging by the ill-kempt fellows who come abroad, are loth to believe—but fair-skinned as any American; and so clean

order to hasten this time, they have organized into bands that prey each on the towns of the other, burning, looting, slaying, until Macedonia is the plague-spot of Europe. And it is these fellows against whom the lone autoist would have to guard. But there are roads in northern Turkey that are safe, and where one needs scarce any other than the regular escort.

thing about you interests. A little trinket from America will win his heart, and he will not allow himself to stand your debtor. He will gather plums from the trees along his roadside or bring out a cheese, not to mention exchanging the cigarettes or serving the coffee, which is but every-day politeness when strangers meet in the empire.

Between the inns there are the *kavanas*,

or coffee-houses, where, over a fire on the earth floor, the water boils perpetually for steeping the rich, brown liquor, and where one may sit out, beneath grape-vine lattices, and sip and breathe in the lazy languor of the east.

Nor is man all that interests in the Orient. Nature comes in for her share. North Turkey is beautiful, far south Turkey is charming. There is, in the latter, all the charm of a coast drive at the Atlantic's east shore with the added beauty of mani-colored villages, and even more gaudily-attired peasants working in the fields. Out on the sea, ancient barks, patterned after ancestors that carried spices from the east in Crusading days, ride along the horizon, and whether they hoist a black flag or no, no one seems to care. Little skiffs, too, go out to sea, and there are schools of fisher-boats that venture just so far from port as they think safe.

Then there are the mountain-lands of Turkey, where forests range untrodden for miles, and where only, here and there, the blue curl of smoke of some lumbering camp, rising skyward, gives inkling that man has come. In the cliff country the lone autoist must take his fare along, and he will find travel hard, though there are detours he can make and roads that are passable.

Now and then, however, autoing would have its drawbacks. The trail sets out fair and fine. Then, of a sudden, almost at dusk, it comes to a stream which horses ford and where there is no ferry, and then the autoist can do little other than return. Again, distances are deceptive and road-maps unobtainable, and one may go to town after town before coming to the one where fresh supplies may be had. A full kit of tools and duplicates of everything possibly breakable on the machine are essentials to a tour in this land.

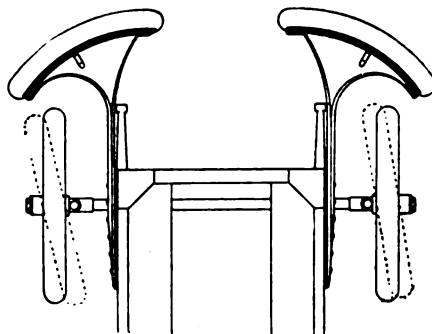
Turkey, however, remains an untrodden field. It is to be hoped this will not be long so. And when the enthusiast makes his advent, let him not forget a camera; if he does he will regret it the rest of his days.

For the first time since the tragic death of Count Zborowski the authorities have permitted a repetition of the Turbie hill climb during the Nice Week, but the course has been reduced from 15 1-2 to 9 kilometers, thereby robbing it of its dangerous turns. The week commences March 25 with a battle of flowers, followed by a *concours d'elegance* at Monte Carlo on March 28. Mile and kilometer races will be run on the Promenade des Anglais on March 29; and the hill climb on La Turbie on March 31. Several valuable prizes will be given.

The Queen Mother of Italy has booked cabins on a New York-bound steamer for the commencement of April, for herself, her suite of three persons and her chauffeur. Her new 50-horsepower Fiat has been especially constructed for the forthcoming American tour.

Simms Safety Buffer.

Notwithstanding the recognized susceptibility of the radiator and lamps on the front of a car to damage by contact with various objects and the desirability of having some sort of fender to thrust foot passengers out of the way to prevent them being run over by the car in event of their being struck, automobilists have been slow to adopt any sort of device to prevent such catastrophes. One of the most practical and unobtrusive fenders for automobiles



METHOD OF ATTACHING SIMMS BUFFERS.

ever brought to public attention is the device illustrated herewith, designed and constructed by the firm of Simms, in France, manufacturer of the well-known Simms-Bosch magnetos.

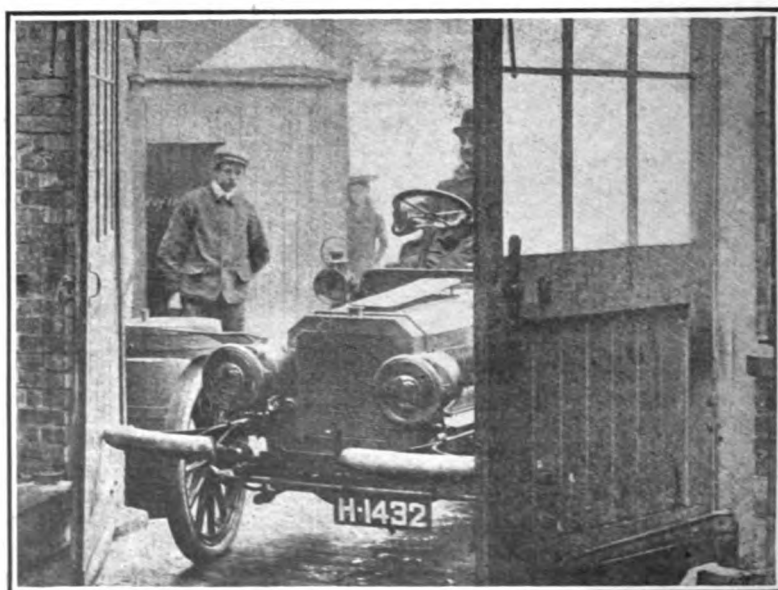
This device consists of a pair of pneumatic cushions mounted on felloes, each of which is secured at the flexible ends of a pair of springs of the form shown in the line drawing. The springs are bolted at their other ends to the side frame of the car so that the buffer extends in front and slightly to the side of the wheel and frame spring. The buffer springs are so arranged that when an impact against one end of the cushion deflects the spring on that side the opposite spring straightens and resists the pull, bringing the buffer back into position. The space between the inner ends of the

pair of cushions permits the chauffeur to crank the engine without difficulty.

The inventors have tested this device in many ways, and in every instance it has met their expectations, it is said. Any collision, however severe, is deadened or absorbed in a great degree, if not rendered entirely harmless. Contact with the wheel of a carriage or wagon in crowded traffic does not result in the crushing of an expensive headlight; the sudden stoppage of an automobile ahead does not cause the spring hanger to penetrate the radiator of the following car; and a glancing blow against a post or corner of a building does not break or bend the steering knuckle. The half-tone illustration reproduced from *La Vie Automobile* shows a chauffeur in the act of opening a pair of heavy garage doors with the buffers. A heedless pedestrian, when struck by a car equipped with the Simms buffers, is thrust to one side forcibly, but without serious injury, so that he cannot fall beneath the wheels, where he would surely have an arm or leg broken, even if he were no more seriously injured.

As the fender has proved so efficient and does not detract from the appearance of a car, it seems strange that some such device is not generally adopted, since it would surely pay for itself in time by the saving of repair bills, protecting such costly attachments as lamps and horns, and, very likely, by protecting the owner of the car from a heavy suit for personal injuries.

For Americans who contemplate automobile tours in Europe, E. B. Gallaher, American representative of Brasier cars, has organized a continental touring service, whereby every detail of a European trip may be arranged before the automobilist leaves this side. The plan provides for boxing and shipping cars, attending to customs and delivering the car where desired in Europe. The service will have representatives throughout Europe.



CAR WITH SIMMS BUFFERS PUSHING OPEN HEAVY DOORS OF A GARAGE.

An Auto Trouting Trip in the Sierras.

By LLEWELLYN H. JOHNSON.

Our route from Los Angeles lay over the main thoroughfare to Pasadena, and with spark advanced and throttle half open the little two-cylinder car climbed the 900-foot lift of ten miles in half an hour.

At Pasadena, with the peaks of the Madre Range towering above, we turned eastward, and for an hour and a half we tore along over fine roads. Finally, where a great gap

shingle, over which the little car bumped and slid, then across a ford with but a few inches of water—California brooks in summer are largest near the source. As we cautiously proceeded and rose higher the soil became firmer; the trail had become but a pair of tracks that crossed and recrossed the creek, often dipping down to the ford at an angle of 35 degrees and rising out of

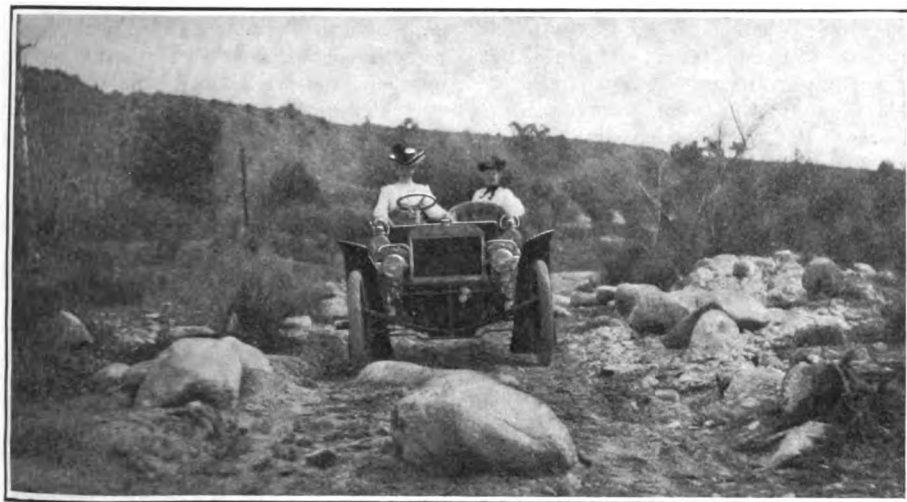
bridge over the ravine. We had reached the sacred precincts of the San Antonio Water Company and the little car could go no further.

By odometer it was nine and a half miles from the entrance to the canyon; vertically it was 6,000 feet. The tires were unscratched and the tank did not steam. The car was backed into a shady nook and we got out the duffle and proceeded to cook supper. The sun had long ago left the canyon and the smoke of the camp fire soon floated up toward the stars. An owl hooted in the distance; below in the arroyo, the bell-like gurgle of water plunging into a deep pool fired the imagination with thoughts of the big fellow and his mate that lurked in its crystal depths. We pulled a cover over the car to keep off the dew, took the cushions for pillows, and after a couple of pipes around the fire, turned in on a sheltered spot, with only the sky above.

Morning dawned like a brilliant jewel, with air crisp and fresh. Good appetites gave relish to the bacon and eggs and coffee. We then took our rods, creels and fly books and started up stream. Ice House Canyon and Bear Flats were both visited, and the bare, rugged cap of "Old Baldy" towered into the indescribable blue, seemingly but a stone's throw from our path. We caught trout, not swinishly, but sufficiently; ate our lunch under a magnificent sugar pine and drank copiously of the cold waters of the creek. We separated and looped the stream so that each would have virgin waters.

After lunch we rested awhile and started down about 4 o'clock. It was easier going out. I alternated brakes to keep both cool and most of the road building we had done was intact, so that we made fast time.

At 7.30 P. M. we pulled up in front of the Saddlerock Chop House, where each hungry motorist was soon supplied with a thick sirloin and a seidel. We were almost desiccated by our exercise in the dry air of the mountains, and everything wet tasted good. Lighted lamps and a quiet run home completed a delightful day's outing.



THIS IS WHAT IS CALLED AN ARROYO ROAD IN CALIFORNIA.

in the mountain range showed the entrance to the canyon, we turned sharply to the left and commenced the long climb to our destination.

It is difficult to describe to Eastern readers who have never visited the great West, the slope of land, locally known as *mesa*, that leads up to the mountain ranges. Mt. San Antonio is 10,800 feet high; the center of the valley, nearly 10,000 feet lower, and from this point the flat country slopes evenly toward the mountains, presenting a grade of 8 to 15 per cent., but looking actually level by contrast with the towering heights in the background.

The road is as straight as the crow flies up this slope—a natural, ungraded track, only the width of the car in most places, sandy, and with many small, loose boulders—cutting a white line through a vast plain of sagebrush and mesquite.

If we had been equipped for rabbit shooting we could have had scores of them, for hundreds crossed our way, and every few minutes a bevy of quail would run silently to cover, or, if we surprised them, would flush with a great beating of wings. But we were looking for the speckled beauties.

After we had climbed for forty minutes on second speed, the road entered San Antonio Canyon and began to wind up the curving valley. After some time we descended San Antonio brook meandering through the gravel and around boulders that formed the "wash," and with some misgivings I drove into a vast bed of

it even steeper, like the roof of a house. One-third of the live cargo was disembarked and trudged behind to gauge the road clearance of the car, so that we should not bend a steering connection on a rock in the middle of the trail.

Up, up, up! We had left the cottonwoods and oaks and were amid the towering pines. The brook looked "fishy" and my fingers itched to drop the wheel and grasp the rod. Finally, after a scramble of almost incredible steepness, where the tires snapped stones out of the trail and sent them flying far below, we found ourselves face to face with a locked and barred gate erected on a rough



COMFORTABLY LOCATED 7,800 FEET ABOVE SEA LEVEL.



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Up to the Law-Abiding Automobilist.

The reckless few continue to make trouble for the army of law-abiding automobilists. Passive condoning of the exasperating actions of this comparative handful of motor users and their leaving to the guardians of the law is no longer advisable or possible. If the considerate automobilist desires to enjoy the pleasures and conveniences of the pastime—often utilized in necessity, as in the case of physicians and others—he must come to the fore and aid in the punishment of these highwaymen of the road.

There will continue to be unfair arrests and the overzealous police will strain their power to trap all motorists. But this state of affairs is traceable to the hit-and-miss driving of the irresponsible element, though, when these ones are eliminated and subdued, there will follow a ready tolerance toward those who obey the intent of the law, even if they go astray in a minor and harmless degree. The traps scattered along the open road or in the outskirts of a city or town will be abandoned, and coincident with it will come an appreciation that automobilists as a class are entitled to the

same consideration as are all good citizens. The chaff of automobiling must be separated from the wheat, but the good automobilist, for his own self-protection, must assist in the work.

The Automobile Club of America, one of the leading clubs of the American Automobile Association, has set a recent example that should be emulated generally under similar circumstances. In New York City a distressing fatality happened on Jerome avenue, a favorite exit from the city for automobilists. One car traveling at high speed overtook another, and, hitting it, caused a crash into a center-of-the-street trolley pole. The man—he was a police sergeant—who had taken his family out for a day of enjoyment, found himself at nightfall a widower with three motherless children. The offending machine escaped, and the Automobile Club immediately offered a \$500 reward for its detection.

Automobiling organizations would do well to seek out these offenders, and, when found, to assist in their prosecution. If guilty, they should be suspended from membership, temporarily, and permanently if the circumstances warrant.



Competitions Mainly Technical.

Looking forward for the next six months one cannot but be impressed with the great difference in the outlook with respect to automobile contests this year as compared with a year ago. Twelve months ago a long slate of track race meets had been arranged, with all the large Eastern and Middle Western cities represented. Now, with the exception of straightaway beach racing at Jacksonville, Atlantic City, and Cape May, hill-climbing contests at Wilkes-Barre and Worcester, and the Vanderbilt Cup Race in October, there are no sporting fixtures of consequence decided upon as yet for the coming season.

Attention has turned from mere speed competition, particularly track racing, to touring and technical contests. The Automobile Club of America is contemplating organizing endurance and economy trials for spring and fall, and the proposal has been made for it to become the American pioneer in promoting tire, anti-skidding, alcohol fuel, and other semi-technical competitions such as have been conducted in Europe during a number of years past.

Undoubtedly there has been a reaction against the too great number of automobile events now crowded into the year, such as track and road races, hill climbs, endurance runs and shows—particularly upon the part of the manufacturer, who would greatly prefer a respite during which he can give needed application to his business. Decision of the Manufacturers' Association last fall to take no part in contests of any kind not promoted by itself or given its approval, and the action just taken to decline sanctioning any shows except those in

New York and Chicago, are clear indications of the sentiments of manufacturers.

A limited number of large and important competitions of varied nature each season, as, for instance, the annual national shows, the Southern winter tournaments, the Glidden tour, the Vanderbilt Cup race, a good mountain climb, an economy and consumption tour, commercial vehicle trials, and tire and skidding tests, organized and conducted by such national organizations as the American Automobile Association, the Automobile Club of America, and the National Association of Automobile Manufacturers, would be far preferable to a large number of minor events. They would be well supported by manufacturers, club members, and private individuals, since the standing of these organizations and their known resources would create confidence in their ability to carry them through successfully and make the results and records of real value.



The Owner and Speed Law Violations.

As the season advances and weather and roads improve, tempting the automobilist to bring out his car and take an early spin, the number of arrests for violations of the speed laws increases rapidly, and it is notable that owners, when arrested, almost invariably declare that they "had no idea they were going so fast."

These facts suggest that if owners really knew just how fast they were moving there would no doubt be less illegal fast running. When a car is driven by a chauffeur the owner usually occupies the rear seat, and there he is unable to see the speed-indicating instrument without getting up and craning his neck over the chauffeur's shoulder, and he really does not know how fast the car is moving. The chauffeur, with the instrument under his eyes, knows just what his speed is at all times, and, if not checked when driving fast, he naturally takes his employer's silence for consent to fast running. If the owner was able to tell at a glance, and without changing his position, how fast the car was really moving he would be in a position to check over-speeding if he so desired; and if he failed to do so, the responsibility for violations of the law would rest on his shoulders instead of those of the chauffeur, who is too often made the scapegoat for his master.

Doubtless it is much easier to make such a suggestion than to devise an arrangement whereby the same instrument may be seen from both front and rear seats; but it is not any more difficult than other problems that have been satisfactorily solved. For that matter, it would not be a serious matter if the instrument were placed where only the owner could see it. Two instruments could easily be fitted if the owner so desired, and there would then be no room for the excuse, "I did not know I was going so fast."

The New A. A. A. Committee Chairmen.

President Farson Names and the Board Approves of Messrs. Hotchkiss, Deming, Thompson and Gorham.

The March session of the Board of Directors of the American Automobile Association, held March 8 in New York City at the clubhouse of the Automobile Club of America, brought with it President John Farson's new committee recommendations. New men were selected to head the four important committees of the association.

Judge William H. Hotchkiss, of the Automobile Club of Buffalo, and president of the New York State Automobile Association, was placed at the head of the Highways Committee, succeeding Albert R. Shattuck, of the Automobile Club of America.

Paul Deming, of the Detroit Automobile Club, was given charge of the Touring Committee, Augustus Post having been his hardworking predecessor.

Jefferson de Mont Thompson, of the Automobile Club of America, succeeded the energetic Robert Lee Morrell as chairman of the Racing Board.

Sidney S. Gorham, of the Chicago Automobile Club and the recently elected A. A. A. secretary, added to his automobile titles by becoming the chairman of the Law Committee. Mr. Gorham is secretary of the Chicago club and president of the Illinois State Association, and has a thorough grasp of the legal complications of automobilizing.

Judge Hotchkiss is well qualified for the Highways Chairmanship, and though he is known to be a very busy man, it is assured that the good work started by Mr. Shattuck will be continued and amplified.

Paul Deming belongs to the old guard of automobilizing, participated in its earliest tours, and has traveled extensively both here and abroad. He will immediately take charge of matters in connection with the A. A. A. tour for the Glidden trophy.

Chairman Thompson of the Racing Board is likely to prove as good a find for the Racing Board as was his predecessor, and having been a spectator of all the important racing events both here and abroad, his qualifications are admitted without question. He will bring to the position a conscientious appreciation of its hard work.

Fourteen directors attended the March meeting.

Lewis R. Speare third vice-president, presiding in the enforced absence of President Farson, who was called to Chicago upon urgent business.

In recognition of the work that has been done by the Associated Automobile Clubs of New Jersey in connection with the avalanche of automobile measures in that state, the directors appropriated \$700 towards the expenses incurred by the legislative activity.

President Farson set forth his administration ideas to the Board by emphasizing the following points:

1. The question of good roads, with national, state and local aid, and with this in view, I have asked Mr. Gorham to prepare a uniform bill to present to the various state legislatures.

2. The question of a uniform bill to be presented to the various state legislatures governing the use of automobiles on the highways and in the city streets. Uniform laws on this question would be very advantageous from every standpoint.

3. The American Automobile Association should set its face like a flint against reckless and insane use of automobiles by irresponsible and careless chauffeurs and operators.

4. A closer relation between the various automobile clubs of America and Europe.

5. A better understanding of the rights of automobilists.

6. Restrictions covering the question of racing, so that the matter may be hedged about with every safeguard.

7. A uniform system of signboards throughout the country, under the sanction of the American Automobile Association.

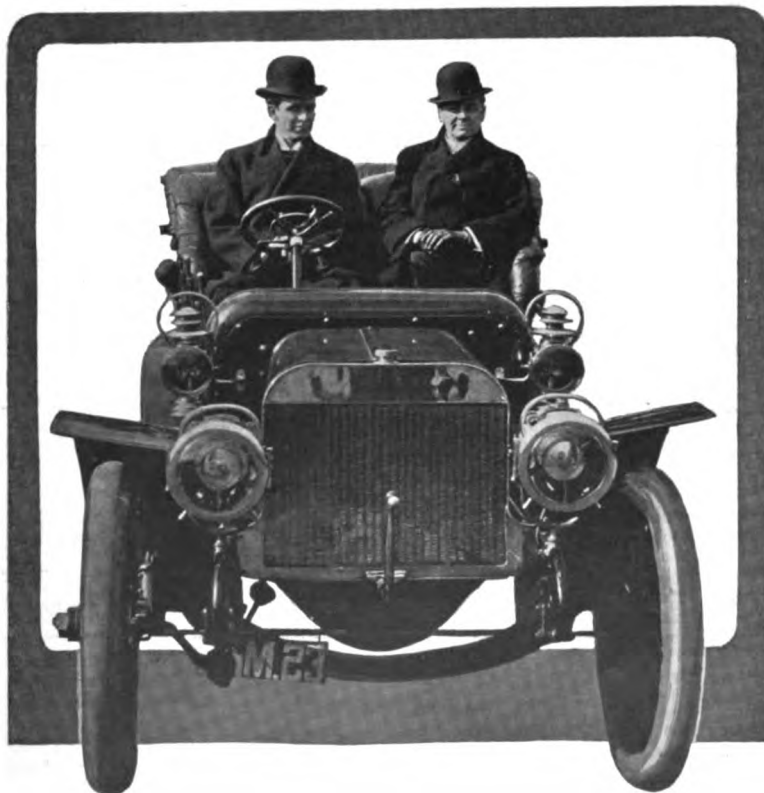
The Glidden tour was informally discussed, and it was decided to leave the route and all details in entire charge of the Touring Committee. Not long ago the National Association of Automobile Manufacturers was asked to suggest rules for the 1906 tour, and a conference between its committee and the new Touring Committee will take place in the near future. The old Touring Committee had such a conference on the same day that the Board of Directors met, but since this committee was to be replaced almost immediately, its powers did not permit of any complete understanding.

Ohio State Association.

CLEVELAND, March 12.—The second meeting of the Ohio State Automobile Association of the American Automobile Association will be held in this city March 15, and a permanent organization will be effected. It is very probable that the headquarters will be in Cleveland, and that a secretary's office will be opened here. It will be the aim of the organization to commence active work as soon as possible, and it is probable that several measures will be presented to the state legislature before it adjourns if possible.

The first effort of the organization will be directed towards improvement of the state roads. The Cleveland club, at a recent meeting, adopted a resolution to ask the legislature to provide for employing prisoners on the highways. An effort will be made to make this a state measure, and to secure the co-operation of union men and farmers. This would be an opportune time to take up such work, as there is an agitation in favor of building a new state prison, the present building being overcrowded.

The Cleveland automobile show was a great aid to the Cleveland Automobile Club. Since the event the membership of the club has been growing with leaps and bounds. Sixty-four operators applied for membership during February and sixteen since the first of the month. The club now has a membership of over 400.



SECRETARY SIDNEY GORHAM AND PRESIDENT JOHN FARSON

Pennsylvania Decides to Go It Alone.

State Motor Federation Objects to the A. A. A. Because It Fathers the Vanderbilt Cup Race.

PHILADELPHIA, March 12.—The efforts of the leading spirits of the automobile clubs of Pittsburgh and this city crystallized last week in the formation of the Pennsylvania Motor Federation, with the two clubs mentioned as charter members and a combined membership of 600. Immediate efforts will be made to add the clubs of Scranton, Wilkes-Barre, Erie, Pottsville, Lancaster, and other cities to the roll, and a recruiting committee will be put to work as soon as possible to gather into the fold all the unattached automobilists in the state. It was decided to remove the initiation fee for the present, and make the dues but \$1 a year.

Much to the surprise of local automobilists generally, the new organization decided not to affiliate with the American Automobile Association, it being argued that the national body's policy is at variance with that of the Pennsylvania Motor Federation in that the latter's objects in life are the

securing of better roads and the protection of the interests of automobilists, while the A. A. A. seems to believe in the efficacy of road races as a means of furthering the cause.

It seemed to be the unanimous opinion of the organizers that road races on the order of the Vanderbilt cup race not only do not benefit the industry, but are actually hurtful.

The president of the Automobile Club of Philadelphia, Isaac Starr, resigned his office in order to accept a similar position with the P. M. F., and Paul C. Wolff, of Pittsburgh, was elected secretary-treasurer. The offices of the new organization will be established at once in Pittsburgh, with Mr. Wolff in charge. W. A. Dick, who succeeded Mr. Starr as president of the A. C. P., was made chairman of the Legislative Committee, and P. A. Meixell, of Wilkes-Barre, chairman of the Good Roads Committee.

During the meeting held to arrange for the tournament there was a reorganization of the Jacksonville Automobile and Motor Boat Association. After the meeting was called to order a nominating committee consisting of W. J. Morgan, Frank T. Cullens and Fred E. Gilbert, was appointed. Their nominations were promptly elected, as follows:

President, Charles A. Clark; first vice-president, Walter P. Corbett; second vice-president, W. R. Rannie; third vice-president, E. A. Groover; secretary-treasurer, Herbert B. Race; board of directors, D. H. McMillan, H. C. Hare, C. E. Garner, and the other officers of the association.

Secretary Race opened the Association roll-book, and everyone present signed the list and paid in advance, at least a portion of his dues.

RACING NOTES.

As a result of the Vanderbilt cup race on Long Island, it is stated that farm land in Nassau County, which at one time could be bought for \$250 an acre, has since been sold at more than double the figure. Thousands of people realized for the first time the advantages of Long Island for country homes, and as a result the Nassau County inhabitants are very much interested in securing the race again this year.

The Cape May (N. J.) Automobile Club will probably hold its first meet of the summer season early in July, at which time the new Cape May hotel will be open to the public. The removal of a jetty at one end of the Cape May beach has increased by several hundred feet its length, which has improved the course to a great degree.

The Austrian A. C. is arranging a small car competition for one- and two-cylinder cars from Vienna to Graz and back on May 12 and 13. All cars competing must have full touring equipment.

Jacksonville Will Have a Beach Race Meet.

JACKSONVILLE, FLA., March 10.—Dates and an official program of events for the Atlantic-Pablo Beach automobile race meet have been finally decided upon at a meeting of the Jacksonville Automobile and Power Boat Association, held this week in the Board of Trade rooms.

All owners of automobiles and auto boats and all good roads advocates in the city had been invited to attend the meeting, and many of the most representative residents were present. All were decidedly in favor of a race meet in April and of beginning active work to secure the construction of a first-class road and automobile drive from Jacksonville to Atlantic-Pablo Beach. The dates definitely decided upon were April 9 to 12, when the tides will be most favorable.

Careful examination of the beach led W. J. Morgan, promoter of the tournament, to advise having the races start at Burnside. Mile posts will be erected at every mile for a distance of twelve miles, and beyond that distance a post will be placed at every fifth mile in a thirty-mile course.

Arrangements have already been made for having four spans of the pier removed, giving a clear opening of sixty feet, the upright on either side furnishing a guiding-pillar for the drivers of the racing cars. The 100-mile race will be abandoned, and in its stead, a 60-mile race, to establish a new record and for a trophy statuette offered by Madame Sarah Bernhardt, will be run off.

Madame Bernhardt, always an automobile enthusiast, has become even more so since one of her countrymen, Victor Demogeot,

won the *Times-Union* trophy and the title of Speed King of the World. After some correspondence between Secretary Herbert B. Race, who is associated in the management of the noted actress for her appearance in this city, and Madame Bernhardt, with the aid of Senator Morgan, the Frenchwoman agreed to offer a trophy for the tournament. It is to be a statuette, of gold and silver, of the great actress, and she has stated that if her theatrical engagements permit she will visit Jacksonville during the tournament, present the trophy she has donated, and ride over the course in the car that establishes the new record.



CHAIRMAN PAUL DEMING, OF THE A. A. A. TOURING COMMITTEE.

Thomas Will Build Three Cup Cars.

BUFFALO, March 12.—E. R. Thomas, maker of the automobile which bears his name, who is wintering in Southern California, made an announcement which will cause comment throughout the automobile world. For the first time Mr. Thomas has made known that there are now being constructed in the Thomas factory at Buffalo three high-powered racing cars to compete for the Vanderbilt Cup this year.

A telegram sent to John Farson, president of the American Automobile Association, several days ago will reopen the discussion that followed the action of the Cup commission, which disregarded three cars that finished in the Vanderbilt elimination trials and substituted three others to represent the United States. Learning that the racing board of the A. A. A. was about to be appointed, Mr. Thomas wired as follows:

"Robert Lee Morrell is said to be a large stockholder in the Locomobile Company. I respectfully urge that no one interested as agent or manufacturer of automobiles be appointed to act on the racing board. I am building three racers at a very large expense, for the sole purpose of winning the Vanderbilt Cup for America, and demand a square deal, which was not given me last time."

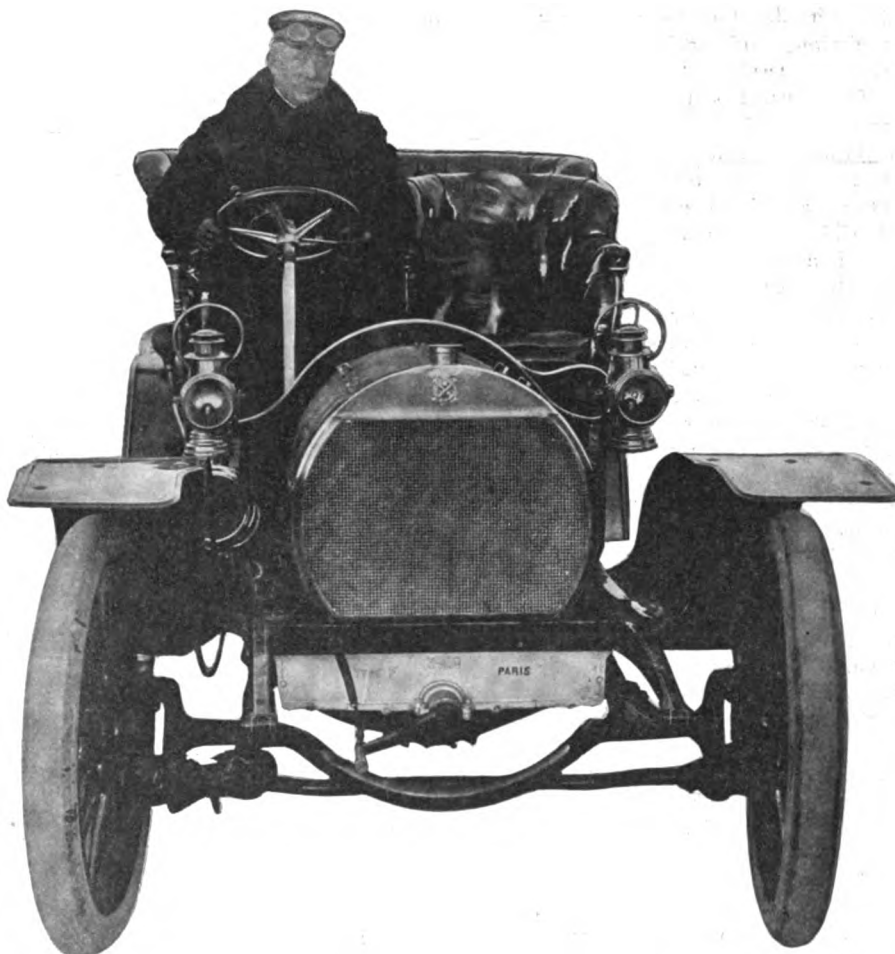
The announcement made of his intentions is as follows:

"I don't believe we should permit foreigners to send automobiles to America and carry off our cups. I am sparing no expense to turn out cars capable of competing with any, and have engaged a driver who will pilot my racer at a speed to equal that of any car the foreign makers may send over.

"Last year what was known as an elimination trial was held to determine the five cars which should represent America. My car qualified. I had no pull on the board, and was counted out with two other machines in favor of cars which had failed to qualify in the test race and later broke down in the real contest, all making a miserable showing. I was at no time given a square deal. Four of the members of the committee which selected the cars to race were interested in certain makes and three

had cars in the contest. An outsider could not expect very much under such circumstances, and I certainly received very little consideration.

"This Vanderbilt race is the automobile classic. It should be America against the world, and if money and skill will bring that cup where it belongs, I mean to get it. If I lose the race it will cost me \$40,000; if I win, that means \$25,000 more for the driver. By all means a racing board ready to act with all fairness should be appointed. I want a square deal, and will insist upon it, before going into another contest."



J. DE MONT THOMPSON, CHAIRMAN OF THE A. A. A. RACING BOARD, AND MEMBER OF VANDERBILT CUP COMMISSION.

Indianapolis May Have a Five-mile Track.

INDIANAPOLIS, IND., March 12.—There seems but little doubt that this city will have a five-mile automobile track, and that Carl G. Fisher, of this city, will build it at his own expense.

In a letter to the State Board of Agriculture, having charge of the Indiana Fair Grounds here Mr. Fisher has offered to construct the track at his own expense if the Board will permit him to locate the track inside of the Fair Grounds, to run around the grounds just inside of the fence.

Mr. Fisher called attention to the fact

that he is backing a movement for an outdoor show next fall and that the track would be an incentive for the show to be held here. He proposes to make the track sixty feet wide excepting at the turns, where it would be 100 feet wide. It is expected that some of the best races in the country could be secured with such a track as an inducement.

The proposal seemingly does away with a troublesome proposition, as many efforts to obtain a tract of ground large enough for a five-mile track have been futile. The

Board is understood to be favorable to the plan, and there is no doubt that the contract will be entered into if the necessary details can be arranged in a satisfactory manner. Mr. Fisher expects the track to cost \$12,000, and men are now staking off the proposed track.

For High Powered Ones.

The Pennington (N. J.) speedway projectors are agreeable to merging their course into the proposed New York-Philadelphia highway for automobilists. Emerson Brooks, who has been particularly energetic in the Pennington matter, is responsi-

ble for the statement that the Pennington directors are heartily in favor of the New York-Philadelphia road, though he believes that John Brisben Walker's estimate of \$6,000 a mile, with a width of eighty feet is too low. A cost of \$24,000 per mile, is the figure given by Mr. Brooks.

It is probable that the Easter meet of the Atlantic City (N. J.) Automobile Club will take place April 26, 27, and 28.

Barney Oldfield is now in the South, with W. H. Pickens again acting as his manager. Race meets may be arranged to place at Atlantic and Savannah, and other southern cities.

Packard Automatic Carbureter.

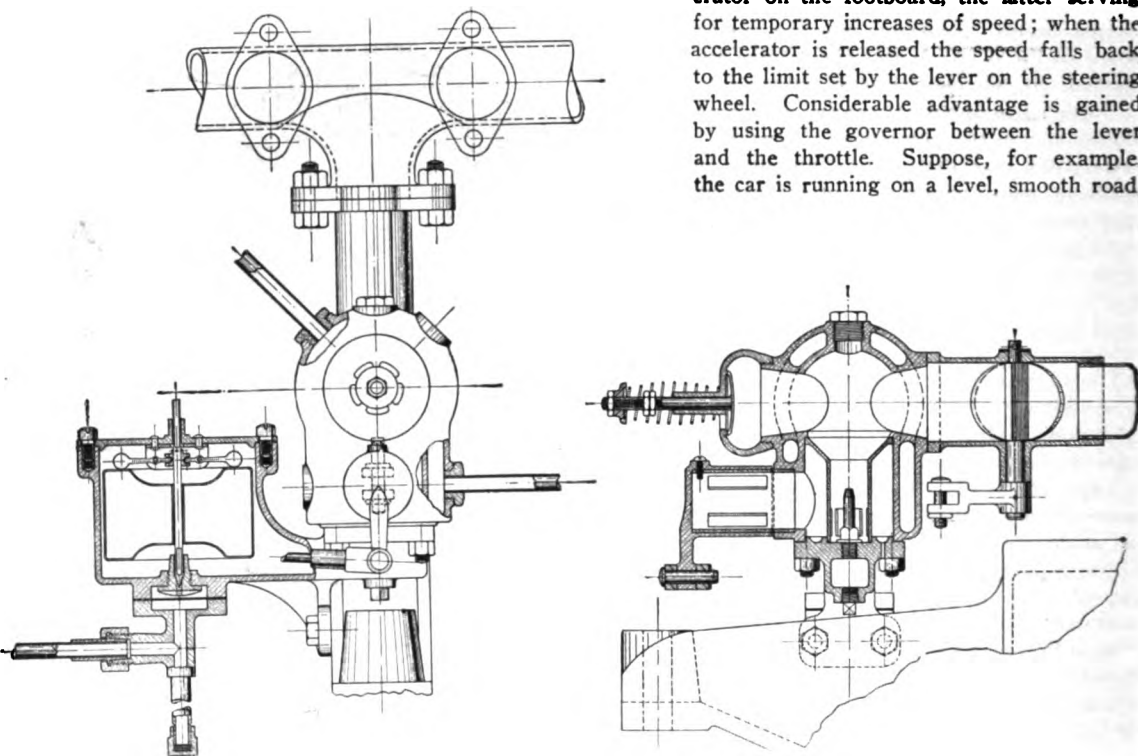
THE carbureter illustrated by the accompanying line engraving is an interesting example of American carbureter practice, and embodies such features as governor control, automatic adjustment of the mixture at varying engine speeds, and maintenance of a comparatively high temperature by means of a jacket filled with hot water, when the engine is running, from the circulating system.

The gasoline from the tank enters the float chamber at the bottom, first passing through a strainer from which any dirt may fall to the bottom of a little trap directly underneath; the trap has a removable cap for draining off sediment. The needle valve is of the usual simple form; the rod passes up through a guide in the top of the float chamber and its lower end slides in a guide which is an extension of the valve seat; grooves are cut in the rod where it passes through the lower guide to permit the upward passage of the gasoline. The rod passes through the center of the float, but the float is free, not being attached to the rod. The valve is opened and closed by the float through a double lever arrangement which the drawing shows clearly. (See left-hand view.) On the rod, just above the float, is a little collar; two levers are pivoted on brackets depending from the top of the float chamber inside;

the short inner ends of the levers engage with the collar while the long outer ends terminate in balls which act as weights and keep the valve normally open. As gasoline flows into the float chamber the float is raised, coming up against the balls and closing the valve; when the level of the liquid drops the float drops with it and allows the balls to descend, again opening the valve. In actual operation there is very little fluctuation, the valve remaining slightly open and allowing the passage of gasoline fast enough to replace what is used by the motor.

Passing from the float chamber through a large passage of rectangular cross section to the spray-nozzle or stand pipe in the mixing chamber, the gasoline rises in the nozzle to the height established in the float chamber, the correct level being determined and permanently adjusted at the factory. The nozzle is screwed into place (see right-

hand view); directly under it is a plug through which sediment may be drained out. The spray nozzle is surrounded by a tubular sleeve, in the walls of which are four slots for the admission of air; this sleeve will be recognized in the engraving by its flaring top, where it opens into the globular mixing chamber above. The regular air intake is seen on the left of the engraving showing the interior of the mixing chamber; the cylindrical extension has slots which correspond with similar slots in a sleeve adapted to rotate on the cylinder; by partly rotating the sleeve the slots are opened or closed to the required extent.



SECTIONAL DRAWINGS OF THE PACKARD AUTOMATIC CARBURETER FITTED WITH HOT CIRCULATING WATER JACKET.

This intake is controlled by a small lever on the dashboard of the car.

The auxiliary air intake is a poppet valve normally held on its seat by a spring; the valve is shown just above the regular air intake. The partial vacuum caused by the intense suction of the engine at high speeds causes this valve to open and admit the requisite quantity of air in addition to the supply taken in at the regular intake. The gasoline drawn from the spray nozzle by the partial vacuum is taken up by the regular air supply, and the mixture finally passes to the motor through the pipe on the right of the engraving, in which is the butterfly throttle valve controlled, through the governor, by the operator of the car. The hot water jacket occupies an annular space surrounding the mixing chamber; the amount of water passing through the jacket and, consequently, its heat, can be regulated by means of a small tap in the

pipng. The air and gasoline in the mixing chamber are heated by contact with the hot walls and not only is the gasoline more thoroughly vaporized, but the quality of the mixture is more uniform because of the uniformity of temperature.

While the carbureter is automatic in its action, the driver of the car can adjust the quality of the mixture from the seat by means of the lever connected with the regular air intake, as already described. When the motor is running slowly all the air used enters through the regular inlet, the auxiliary valve coming into play only at comparatively high speeds.

Throttle control is effected through the governor by the usual lever on the steering wheel, and also by a foot-operated accelerator on the footboard, the latter serving for temporary increases of speed; when the accelerator is released the speed falls back to the limit set by the lever on the steering wheel. Considerable advantage is gained by using the governor between the lever and the throttle. Suppose, for example, the car is running on a level, smooth road,

and the operator sets his lever at a point that gives a speed of fifteen miles an hour. As long as the road conditions are unchanged, the same throttle opening will keep the car at the same speed; but if a slight rise is encountered, or the road becomes rough, or if a down-grade is reached, the throttle opening must be altered accordingly to maintain the fifteen miles an hour. Without a governor the lever must be shifted at every variation of the road surface; but with the governor, the throttle opening is varied automatically, and, within the limitations of the motor, the speed is kept constant under all conditions, the driver not touching his lever unless he wishes to change the rate of motion of the machine. The centrifugal governor is mounted in one of the half-time gears and is connected with the throttle through the well-known simple arrangement of sliding collar, fork and connecting rods.

PHILADELPHIA LIKES SHOWS.

Dealers in the Quaker City State that Numerous Sales Have Resulted.

PHILADELPHIA, March 12.—Whatever may be the views held elsewhere, there is but one opinion here as to the trade value of local automobile shows. Although the period between the holidays and the opening of the recent exhibition in the National Export Exposition Building was marked by a steady demand due undoubtedly to the excellent weather, it remained for the show to really set the wheels of trade a-going. Beginning with the phenomenal business which characterized every one of the seven show days, the following week had hardly opened before the beneficial effect of the show week's missionary work became apparent. At every branch house and agency demonstrators have been busy all day, every day, clinching the good impression made upon prospective customers during the week of the show, and the almost invariable result has been the filing of an order and the payment of a deposit. And in many instances customers have admitted that they became inoculated with the auto microbe while attending last week's exhibition. There will be an automobile show here in 1907.

Dropping generalities, here are a few specific instances to indicate the extent of the business done.

Manager Cohen, of the Reo branch, confesses to fourteen bona fide sales during and since the show—a period of ten days.

Manager Smith, of the White Garage, ascribes the six sales of last week directly to the show.

The Kelsey Motor Car Co. scored twenty-two orders since the opening night of the exhibition.

Manager Young, although having had the local agency for the Gilde car less than a month, rang up ten orders up to last Thursday.

The Knox Automobile Company owns up to six actual sales and the same number of "prospects" of such excellence that sales are practically assured.

Manager Hoffman, of the Ford branch, registered no less than fifty-five orders from the opening night of the show up to Saturday last.

Five sales during and four since the show is the record made by Manager Maltby, of the Winton branch.

The Foss-Hughes Company received and delivered four carloads of Pierce-Arrows and Cadillacs on Tuesday and Wednesday last, and will need two more carloads at once to catch up with post-show orders.

W. Wayne Davis, of the Keystone Motor Car Company, admitted the sale of eight Autocars during and since the show, and said that the company's entire allotment of Packards had been disposed of.

Manager Smith, of the Rambler branch, has taken orders with a recklessness that bodes some unpleasant quarter-hours with

customers who fail to receive their cars on schedule time. Henceforth, "until things simmer down a little," he said, "we will not promise delivery before sixty or ninety days." And so the story goes down "Gasoline Row"—excellent business.

The Philadelphia Automobile Trade Association, under whose auspices the show was held, made a big thing out of it financially, and at a meeting on the 20th the members will doubtless listen to the reading of the treasurer's report with no little satisfaction.

One direct result of the boom which resulted from the exhibition is the establishment of new branches and agencies here. Besides those of the Mercedes Import Company, at the southeast corner of Broad and Race streets, and Smith & Mabley, at the Bellevue-Stratford Garage, the Rainier Company has secured the old quarters of the La Roche Automobile Company, at 236 North Broad street; the H. A. Connors Company will establish a temporary office at 325 North Broad street until the building at the southwest corner of Broad and Vine streets can be fitted up for the reception of its line of Rochet-Schneider and Darracq cars; the North Philadelphia Auto Station, 3425 North Broad street, has secured the agency for the Crawford car, built at Hagerstown, Md. Several other agencies are to be placed here before the end of the present month.

The Palace Garage, 540 Washington street, Camden, N. J., C. C. Albertson, manager, has been given the local agency for the Cadillac and Marmon cars.

The Dietz Auto Company, composed of John Dietz and F. J. Plumber, the last-named formerly with the Foss-Hughes Company, has established a general automobile repair and garage business at 1313 Irving street.

THE GROWING GARAGE LIST.

Charles H. Childs & Co., of Utica, N. Y., are just completing in that city a new garage which they believe to be the finest between New York City and the West. It is located in the central part of Utica and is 90 by 100 feet in size. It will be equipped in the most up-to-date way throughout.

Vacant property at the corner of Station street and Schuyler avenue, in Kankakee, Ill., has been leased by Joe Fleming and A. J. Brown as a site for the erection of a garage. The building will be 40 by 60 feet.

Contracts have been let by the Motor Vehicle Garage Co., 1133 Main street, Buffalo, for the construction of a concrete garage building, 84 by 84 feet, at 632-638 Washington street, that city. This building will be used entirely as an electric vehicle garage. The company is also planning for a large building in the heart of the wholesale district to be used strictly for taking care of electric commercial vehicles. In its present establishment on Main street the company is able to store 100 gasoline cars and 150 electric vehicles.

TRADE NEWS FROM CLEVELAND.

Cleveland, March 12.—Cleveland's automobile "tire row" is shifting. For the last two years nearly all the tire concerns have had branch stores on Huron street, between Erie and Euclid, in close proximity to the rows of automobile stores on these two streets. Late-ly the owners of property in that district commenced to raise rents, and with one accord the tire people began moving, with the result that a few weeks will see the passing of the last tire store in that immediate neighborhood. The Morgan & Wright store and repair shop have been moved from 347 Huron street to 1612 Euclid avenue (new number). The G & J Tire Company will soon move from 337 Huron to 1837 Euclid; the Diamond Rubber Company announces that it will move from 323 Huron street to 1514 Euclid. The Motor Car Supply Company, which handles tires and supplies of all kinds, has removed from 345 Huron to 1829 Euclid.

The Oliver Electric Vehicle Company, of which W. O. DeMars is manager, has opened a large garage at 180 Murison street. Mr. DeMars has been in the business since its inception, and until recently had a garage on Euclid avenue, near the entrance to Wade Park. The new establishment is a six-story building, with 80,000 square feet of floor space. The company will devote its entire attention to electric vehicles. It is not the intention to handle outside cars, and while a few machines may be assembled to order, the chief business will be the repairing, storing, and charging of electric vehicles. Especial attention will be paid to caring for commercial vehicles, and arrangements have been made to care for the machines of several concerns that will adopt electric delivery wagons this summer. The company has a well-equipped machine shop and facilities for charging a number of cars at a time.

The old factory of the General Automobile Company on Hamilton street, which was operated for several years by the Studebaker Automobile Company in the manufacture of two-cylinder runabouts, has been cleared out and the machinery removed to the company's main factory at South Bend, Ind. A portion of the old building is being utilized by the Royal Motor Car Company as an annex to its factory, which is only a short distance away.

The Cleveland Automobile Top & Trimming Company, recently incorporated with \$10,000 capital stock by A. M. Snyder, A. A. McCaslin, G. D. McGuirrin, Elmer G. Derr, and J. Dickinson, is now occupying a large building at 806 Vincent street, the quarters formerly occupied by the Central Automobile Company. The company will make tops and trimmings, and may go into the manufacture of bodies. The place has been well equipped with machinery and there is a blacksmith shop for iron work. Twenty hands are now employed, and the company is doing work for the F. B. Stearns Company, the Blakeslee Electric Vehicle Company, and a number of local stores. J. Dickinson is manager.

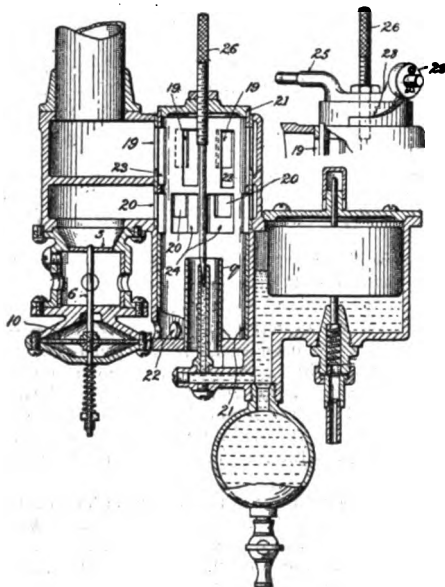
The Garford Company, manufacturer of automobile parts, has increased its capital stock from \$400,000 to \$600,000. It now seems almost certain that the plant of this company now in this city will be moved to Elyria, where the other factory is located, and a much larger plant erected. Mr. Garford promised his home city that the plant would go there if citizens would provide houses enough to take care of 1,000 workmen whom he expected to employ next year, and efforts in this direction are proving successful. Mr. Garford states that the plant will have about 100,000 square feet of floor space and that \$300,000 will be invested in new buildings and machinery. The company plans to cater to the commercial vehicle business more extensively another year.

Patents

Carbureter.

No. 813,653.—F. A. Law, of Hartford, Conn.

An automatic carbureter with a somewhat elaborate system of air and fuel control. The main air stream enters at the base of the tube *q* around the spray nozzle, and the opening of the latter is controlled by the needle valve formed by the threaded stem *26*. As the suction increases, the carbureted stream is diluted by air entering through the automatic valve *5*, whose stem is connected to a diaphragm *10*, which acts as a dashpot. The air thus entering passes through ports *20* and corresponding ports *24* in the annular shutter *21*, which acts as a throttle. The throttling action is obtained by rotating *21*, thus partly closing the ports *19*, through which the completed mixture passes. As ports *24* are wider than ports *23*, ports *20* are not affected. When the throt-



LAW AUTOMATIC CARBURETER.

tle is opened, the spray nozzle is opened also, and at the same time another set *22* of dilution inlets is uncovered. Both of these effects are produced by lifting *21* at the same time that it is rotated. For this purpose the arm *25* (see detail) by which *21* is rotated, is extended and carries a roller *29*, which runs on a camway *28*.

Carbureter.

No. 806,822.—O. Millard, of Flint, Mich.

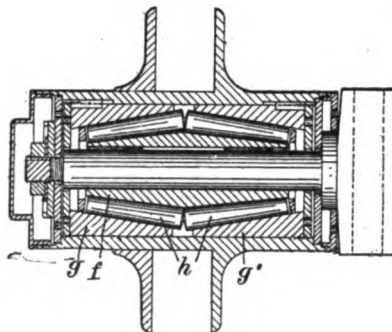
A carbureter having the spray nozzle closed by a needle valve which has an iron armature at its upper end, and is lifted at suitable intervals by the attraction of an electromagnet.

Frame for Glass Windshield.

No. 813,524.—J. C. Simm, Jr., and A. P. Olsen, of Chicago.

A frame whose principal feature is the

use of a grooved wood filling for the longitudinally-slotted tubes of which the frame is chiefly composed. The glass fits the groove in the wood, and the edges of the



LOCKWOOD ROLLER BEARING.

slot being wider than the groove, do not touch the glass.

Roller Bearing.

No. 813,905.—C. S. Lockwood, of Newark, N. J.

A roller bearing substantially of the form shown, having long, slightly tapered rollers *h*, with their large ends abutting, and suitable cones *f* and *g'*, keyed to the stationary axle and to the wheel hub respectively.

Metal Body.

No. 813,460.—H. and A. P. Smith, of Springfield, Mass.

A method of joining the sheet aluminum panels without the use of angle iron supports, at the same time concealing the rivets and rendering them less liable to work loose than when iron supports are employed.

Combined Tachometer and Cyclometer.

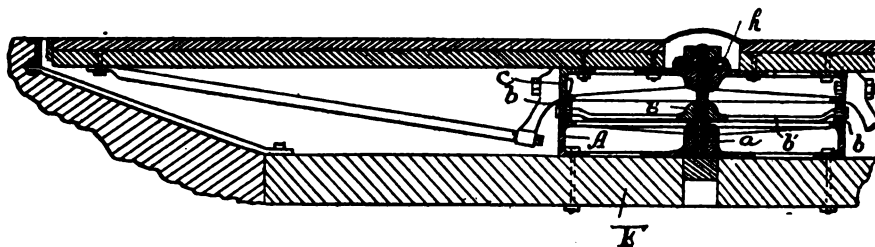
No. 813,861.—C. H. Warner, of Beloit, Wis.

The combination of the Warner Automobile (Patent No. 745,468) with a cyclometer such as the Veeder.

Turntable.

No. 813,462.—H. R. Stickney, of Portland, Me.

A form of turntable which does not employ rollers under its outer circumference to support an unbalanced load. Bolted to the foundation *F* is a circular track *A*, on



STICKNEY AUTOMOBILE TURNTABLE, WITHOUT PERIPHERAL ROLLERS.

which run rollers *b* carried on the arms of a loose spider *b'*. On these rollers rests the complimentary track *c* of the turntable. A central bolt *a* is securely locked in the foundation, and at its upper end it carries a

ball thrust bearing *h*, which holds the turntable down. When the load is unbalanced, the rollers *b* nearest the load act as a fulcrum, and the tilting tendency is resisted by the ball bearings.

Non-Skidding Tire Shoe.

No. 813,934.—J. Albers, of Aix-la-Chapelle, Germany.

A studded leather band differing from the usual form mainly in that the outer strip, and not the inner, is wide enough to cover the rubber shoe completely, and the inner strip is scarfed down to a thin edge at each side. The rivets pass through both strips.

Tire.

No. 813,529.—R. G. Smith, of Buffalo, N. Y.

A tire composed of wood segments, backed by a thin strip of rubber, and bolted into a groove in the rim. A narrow steel band, recessed into the tread of the blocks, helps to hold them.

MOTOR BOAT ACTIVITIES.

Indianapolis, Wilmington and Chicago Plan for the Season.

INDIANAPOLIS, March 12.—The coming season will see a revival of aquatic sports in this city, and chief among these will be motor boat racing. Motor boat racing will be largely under the auspices of the Indianapolis Launch Club, which was organized two years ago with twenty-five members, the membership being limited to owners of boats. It is now planned to increase the membership to about 100 members, limiting it only to those who are interested in the sport, but not necessarily owners of boats. When the club was organized a fine boat-house was built, but this is to be succeeded by a fine clubhouse which will be built this summer and for which ground has been leased at Broad Ripple Park on White river.

A number of motor boats are being built in anticipation of the event, the largest of which is to be a thirty-foot boat, now being constructed in the Fisher Automobile Company's garage for Carl G. Fisher. The boat is to be fitted with a six-cylinder motor of special design, and it is expected will de-

velop 40 horsepower. Other boats from similar designs are being built for William Baker, G. A. Deitch and August M. Kuhn. Motor boat races will be held Decoration Day, Fourth of July and Labor Day.

Doings of the Clubs.

If sufficient enthusiasm is manifested in Brooklyn, the Long Island Automobile Club will take charge of a motor parade which will be held in the early summer. Whether the day is past when an automobilist can be induced to parade is a question, but a substantial array of vehicles would undoubtedly emphasize the great growth of the industry.

* * *

The Peoria (Ill.) Automobile Club will hold its second annual banquet Monday, March 26, and it promises to be the most auspicious event in the history of the club. The Peoria club starts in on its third year with 83 members, and with brightest prospects for future growth and influence. It is now the second largest club in Illinois.

* * *

About fifty automobile enthusiasts attended a dinner given by the members of the Camden Automobile Club in Camden, N. J., last Thursday night. President Samuel Sparks acted as toastmaster and made a brief address, in which he referred to the ignorant opposition which the automobile, in common with all other innovations, must overcome. The officers of the Camden organization are: President, Samuel Sparks; vice-president, George H. Rhedemeyer; treasurer, Alpheus McCracken; secretary, H. G. Ballinger.

* * *

Students of the Polytechnic Preparatory School in Brooklyn, N. Y., have organized

a club, which will be known as the Poly Prep Automobile Club. Monthly club runs will be held and the organization will seek to interest the students of the school in automobiles and their construction and operation. Officers have been elected as follows: President, Roy E. Pardee; vice-president, James B. Cronin; secretary, J. C. Van Cleaf; treasurer, E. C. Gillespie. A touring committee will be appointed to arrange for out-of-town trips, the first of which is to be held on March 31.

* * *

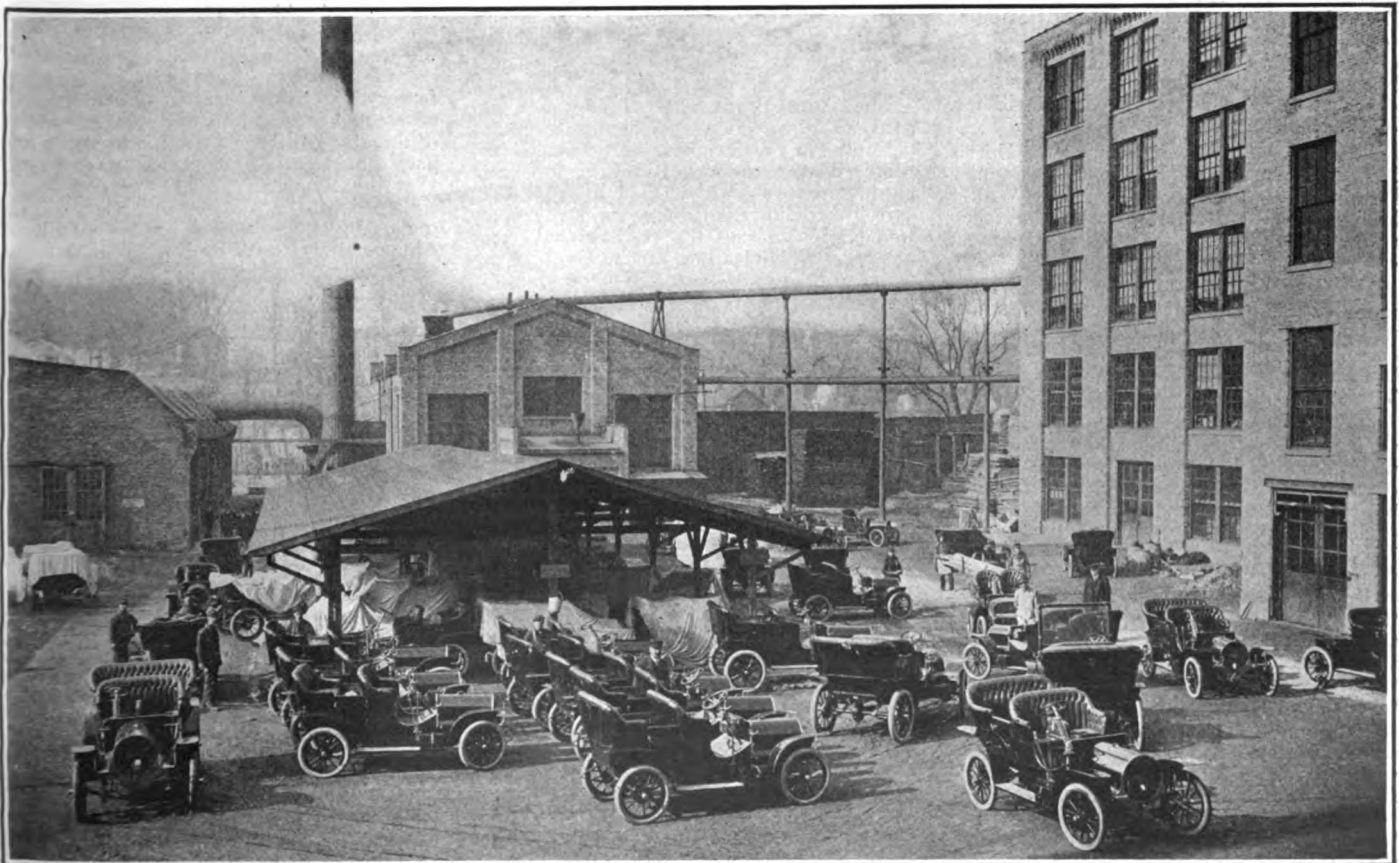
Plans for its forthcoming economy contest were considered at a special meeting of the New York Motor Club, held Monday night at the headquarters of the club in the Hotel Cumberland. No date was selected for the trials, but it is likely they may be held this spring. A six-days' run has been planned, somewhat on the lines of the first test held last fall, but several changes will be made in the conduct of the event. A committee is now drawing up the conditions that will govern the contest. Owing to the inability of F. J. Griffin to give the necessary time to the office of treasurer, the directors transferred R. H. Johnston from the second vice-presidency to that of treasurer, and put Mr. Griffin in the second vice-president's place. A. L. Kull and W. D. Hurlbut were elected to the Board of Directors. President W. J. P. Moore was appointed the club's delegate on the board of the New York State Automobile Association.

Wind Spoiled Airship Race.

The great airship race between Charles Levee, the French aeronaut, and Leo Stevens, his American competitor, scheduled to take place March 10, starting from Pittsfield, Mass., was interfered with by a furious gale that swept through the Hoosic valley. Both balloons were filled with gas, and the *Aero Club No. 1*, Stevens's car, broke from her moorings and escaped so effectually that it has not yet been found. Levee's craft was punctured while tugging at her ropes. Exactly when the event will take place is somewhat indefinite, but Comte de la Vaulx is expected to arrive in the near future with three new balloons, which will be taken at once to the Pittsfield headquarters.

A Period of Instruction.

CLEVELAND, O., March 12.—As a result of many protests from automobilists against the rigid enforcement of the recent road rules, Chief Kohler of the Cleveland police has receded somewhat from his position that first offenders must be brought in. He has ordered the bicycle and traffic squad to carry with them copies of the new traffic ordinance and to caution those violating its provisions instead of making immediate arrests. A number of women were stopped at the down-town district for cutting sharp corners. They were politely instructed just how turns must be made and were presented with copies of the ordinance.



THESE ARE BUSY TIMES FOR MANUFACTURERS—VIEW OF THE FRANKLIN COMPANY FACTORY YARD AT SYRACUSE, N. Y.

News and Trade Miscellany.

One of the most novel uses to which an automobile has yet been put is that of collecting washings. Battle Creek, Mich., can also claim the distinction of being the only city in Michigan where a machine is put to that use. Mrs. Christina K. Huber is the owner of the machine. She earns from \$20 to \$25 per week at washings and purchased the machine, which is a runabout, to assist her in collecting and delivering.

The relatives of Eldon Sarver, a five-year-old boy who was killed in Philadelphia last summer by being run down by an automobile, have petitioned the State Pardon Board to commute the sentence of William Myers, the chauffeur in charge of the car, who was sentenced to eighteen months' imprisonment for manslaughter.

Estimates for supplying three gasoline motor buses are desired by Austrian parties. The vehicles must have a carrying capacity of eighteen to twenty passengers, be divided into two compartments and have a roof suitable for carrying baggage. Manufacturers interested should address Karl and Emanuel Tauber, Czernowitz, capital of Bukowina, Austria.

The National Business Show will be held in the Coliseum, Chicago, from March 17 to 24, inclusive, under the management of H. A. Cochrane and F. W. Payne. The displays will embrace all sorts of office furniture and appliances for facilitating and systematizing the work and record keeping in business offices.

George O. Barnes, veteran driver for the Haynes Automobile Co., is now touring Texas with one of the 50-horsepower Haynes cars and reports good business. The road conditions through the state are fairly good.

An agency for the Compound cars has been placed by the E. H. V. Co., of Middletown, Conn., with Hegeman & Arnold, 1239 Fulton street, Brooklyn, N. Y., for the Long Island district. Another agency for these cars has been placed with Robert Kolbee, of Syracuse, N. Y.

L. Le Roy Moody, formerly with Norris Mason, is the new manager of the Napier Motor Car Company, of New York. Walter H. Woods, the former manager, has been made secretary and treasurer of the main company in Boston.

The Garden City Hotel, now familiar to so many automobilists on account of the automobile competition held recently on Long Island, has purchased two four-cylinder Locomobile gasoline cars for rental service. These cars will be delivered about April 1.

A Pittsburg branch will be opened in the near future by the Winton Motor Car Co., with Earl Kiser, the well-known racing driver, acting as manager. With him will be John S. Johnson, another ex-champion cyclist who naturally graduated to automobilism. The Winton company has purchased the Hiland garage, at Baum and Beatty streets, in the center of the automobile district, and will take exclusive possession of the property on April 15. Meanwhile Kiser will share floor space with the Hiland Automobile Co., which on April 15 will remove to new quarters.

The James Macnaughton Co., 649 Main street, Buffalo, was recently incorporated with \$100,000 capital stock to manufacture and sell electric vehicles. The new concern contracts with manufacturers to market and handle vehicles built by the manufacturers to specifications furnished. The company will make a specialty of electric commercial vehicles in all types and sizes, and already

represents exclusively the Pittsburg Motor Vehicle Co., of Pittsburg; the Rech-Marbacher Co., of Philadelphia, and Brunn's Carriage Works, of Buffalo, and is closing contracts with two other large factories.

Nearly 500 exhibitors have been allotted spaces at Cordingley's Motor Car Show in the Agricultural Hall, London, which will open March 24 and continue till March 31. In addition to the representative display of British vehicles, Italian, French, and American models will be shown, while several new 1906 cars will be exhibited for the first time. Supplementary to the light car section, the show of heavy vehicles, including lorries, buses, and municipal vans, will be thoroughly comprehensive, affording conclusive evidence of the growth of this branch of the industry.

The Gaeth Automobile Company of Cleveland has sold six gasoline delivery wagons to the Automobile Express Delivery Company, which has been formed in Cleveland by B. H. Rose, L. F. Sholes and others. The company proposes to furnish delivery service for several large retail concerns and has already secured several contracts. One of the cars has covered the whole of the West Side for one of the large dry goods companies, doing the service of four delivery wagons at considerably reduced expense.

Authority to make arrangements for the establishment of a factory in America for the manufacture of the Michelin tires under the French patent was conferred upon E. D. Winans, who returned from France in January with a contract as exclusive representative in the United States of Michelin & Cie. for 1906 and thereafter. When in operation the American factory will make only the finest class of goods from the best Para rubber, it is announced. Michelin factories have already been built in Italy, England and Germany. The output of the French plant is 1,600 tires a day.

The Auto Brass and Aluminum Company, of Flint, Mich., has filed a voluntary petition in bankruptcy in the United States district court at Bay City, following an involuntary petition filed a short time ago by creditors. Referee in Bankruptcy Lee E. Joslyn says the creditors will now get together and allow the involuntary petition to take precedence. George Marston, who was appointed receiver, will be superseded by a trustee to be elected at a meeting of creditors at Flint, March 17. The company gives its liabilities as about \$25,000 and assets at about \$17,000.

The Snutsel Auto Supply Co. has been incorporated and has opened offices and salesrooms at 1534 Broadway, New York. Paul L. Snutsel is president and general manager; Joseph C. Hoffman, vice-president; and Rudolph Weinacht, secretary and treasurer. The company manufactures, imports and exports automobile supplies and accessories and controls the American rights for a number of European patents. Both wholesale and retail business will be conducted.

The Electric Automobile Co., recently organized in Savannah, Ga., with \$20,000 capital stock, has located in a new building on Bryan and Bull streets, having 12,000 square feet of floor space. This has been equipped with all modern appliances for the care and maintenance of electric vehicles, which will be handled exclusively. Having purchased the business of the Electric Supply Co., the new company becomes local agent for the Pope-Waverley line.

Joseph S. Walker, president, has developed the electric automobile business in Savannah and introduced these into Atlanta, where he is president of another company. Other officers of the Electric Automobile Co. of Savannah are: R. M. Hull, vice-president; Stephen N. Harris, secretary and manager. Nine other business men of the city are represented in the directorate.

A. H. Chadbourne has gone to Paris in the interests of the Richard-Brasier agency, 228 West Fifty-eighth street, New York City.

The Rainier Company has closed agency contracts for the sale of the Rainier cars during 1906 with the following: Van Automobile Co., St. Louis, for Missouri and Southern Illinois; Paxson Motor Car Co., Cleveland, for Ohio; A. H. Hayes, San Francisco, for California; Plaza Automobile Co., Brooklyn; T. S. Morse, Lenox, Mass., the Berkshire district. The Rainier Company will also open a Philadelphia branch shortly under the management of A. J. Picard, who will be best remembered as having established the first 1,000-mile non-stop record between New York and Boston three years ago.

The six-cylinder Napier, shown by Francis E. Drake at the Cleveland show, has a road record which staggers automobile enthusiasts in this city. Mr. Drake claims that the car has been run over 11,000 miles during the past few months with no repairs to working machinery. A near approach to this machine is Cleveland's municipal automobile, a 45-horsepower Stearns of the 1906 pattern, which was placed in service last September 17, and which has covered over 8,900 miles since that time. It is running every day at the average of seventy miles a day, and thus far the repairs to machinery have amounted to very little.

To provide for an enlargement of its factory and additions to the equipment, the capital stock of the Standard Roller Bearing Co., of Philadelphia, has been increased from \$2,000,000 to \$3,500,000. A four-story factory, 150 by 200 feet in dimensions, will be erected immediately for the manufacture of annular ball bearings, on which the company holds basis patents. During the past year the Standard Roller Bearing Co. has equipped with machinery a four-story building 95 by 200 feet, and has also built and equipped an iron foundry 70 by 150 feet, two stories in height; hardening and tempering building, 70 by 150 feet, and a crucible steel castings plant, 60 by 100 feet. With the new building to be erected the company will employ over 1,000 hands in the manufacture of steel balls, ball bearings, roller bearings, automobile axles and annular ball bearings.

Medals for mileage and encouragement of touring are this year to be offered by the federation of American Motorcyclists. There will be gold, silver and bronze, offered in each department, the competition opening April 1 and closing November 30, in order that riders residing in "all-the-year 'round" climates may not have an advantage over their less favored brethren. Mileage reports are to be rendered monthly to M. E. Toepel, chairman of the F. A. M. Roads and Tours committee, 930 Columbus avenue, New York, and a final and sworn statement submitted at the close of the year. The medals for the encouragement of touring will be awarded the motorcyclists visiting the greatest number of counties in the United States between the same dates. Verification in the form of attested post cards bearing the post-mark of a town in each county visited must be mailed to Chairman Toepel.

THE AUTOMOBILE

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No. 12

NEW CARS OF THE SUCCESSFUL BOSTON SHOW.

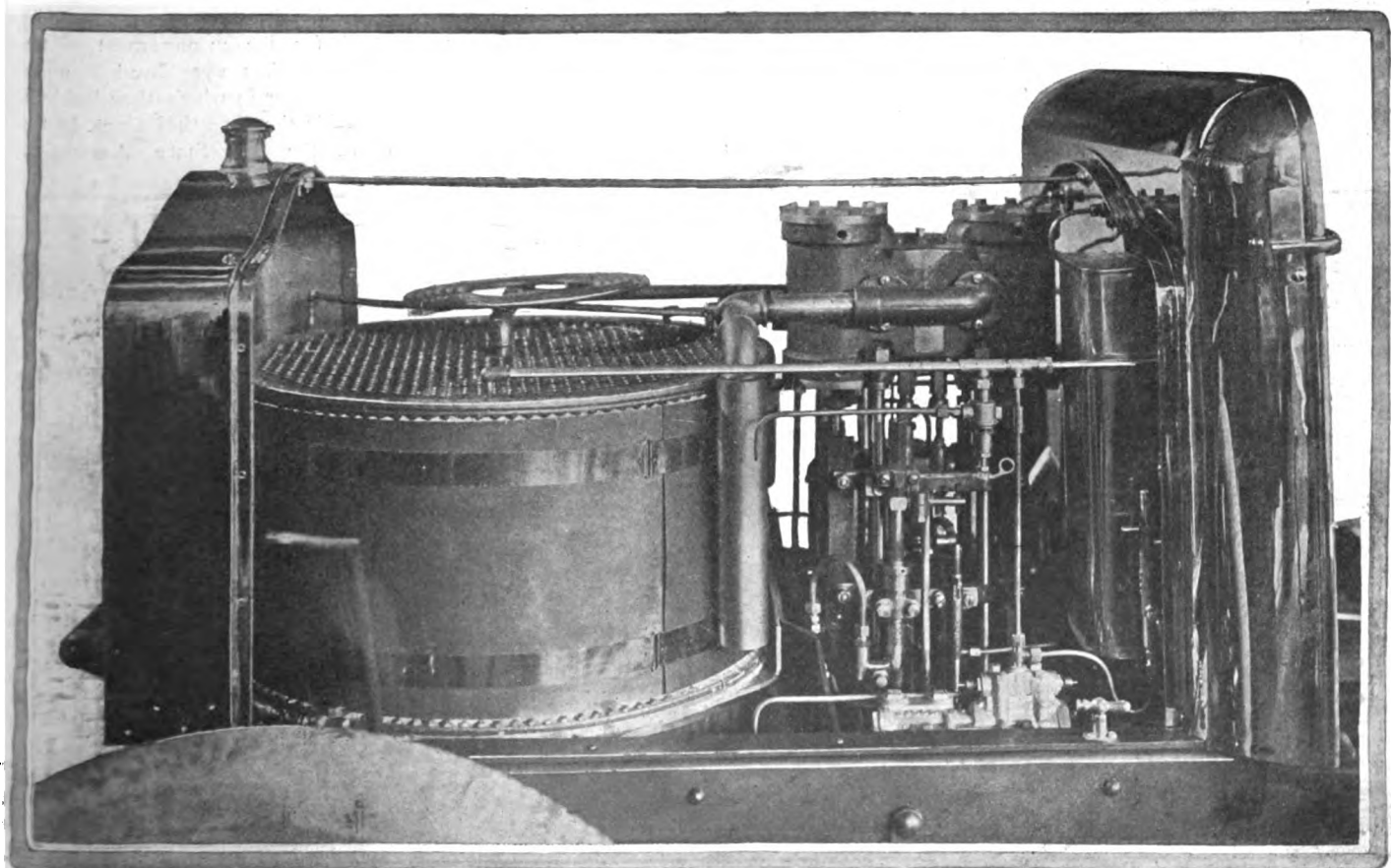
Boston, March 17.—At the Boston show the visitor always expects to see the newest ideas in steam cars, and this year again he was not disappointed.

One of the interesting steam novelties was the Ross touring car, built at Newton, Mass., by Louis R. Ross, of 1905 Ormond-Daytona fame. The machine, which is illustrated in the accompanying photographs, is practically identical in outer appearance with the modern motor-in-front gasoline car. The detail engraving shows the front

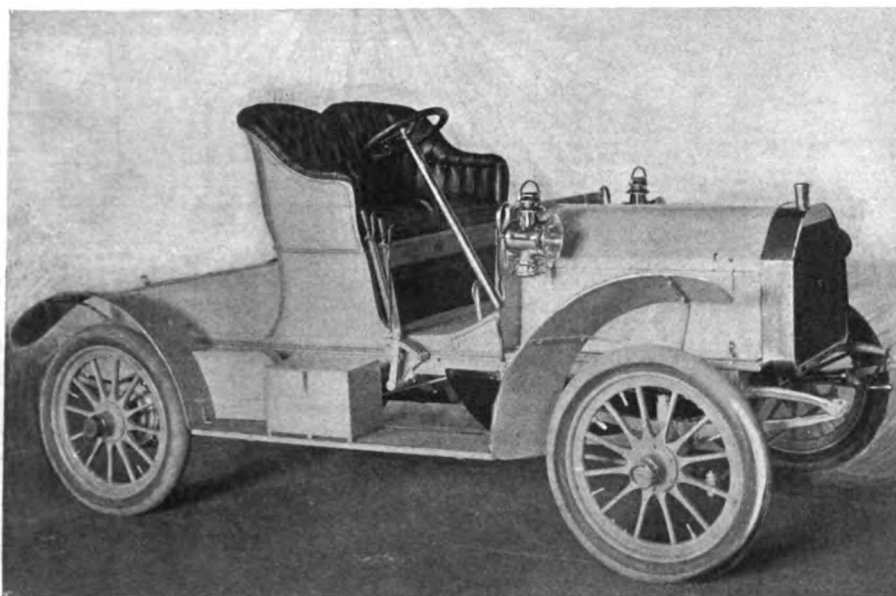
end of the car with the bonnet removed. It will be seen that the entire power plant is compactly arranged under the bonnet, with the boiler of the vertical fire-tube type in front and the two-cylinder, high-pressure vertical engine set immediately back of it. The engine is of 25 nominal horsepower and is fitted throughout with Hess-Bright ball bearings. The boiler is 25 inches in diameter and the engine has cylinders 4 inch by 5 inch. The wheelbase of the car is 108 inches. It carries five passengers.

Wheels are 34 inches with 4-inch tires. The total car weight is 2,600 pounds.

Another new steamer is the Essex, built by the Essex Motor Car Company, of Boston. This also has the lines of a modern side-entrance gasoline touring car, and is built upon the Serpollet system. The steam generator is of the semi-flash type of 15-20 rated horsepower, and the motor is a four-cylinder, single-acting, double-opposed, with cylinders 3 1-2 inches by 4 inches. The valves are of the poppet type.



THE ROSS 25-HORSEPOWER STEAM CAR, SHOWING LOCATION OF BOILER AND ENGINE UNDER HOOD.



GROUT GASOLINE RUNABOUT, FITTED WITH TURTLE BACK.

Among the interesting machines of the gasoline type which has not been displayed at the New York or Chicago shows, the Sturtevant attracted a large share of attention. In this year's model the motor is in front, under the hood. It is of the four-cylinder vertical type with cylinders cast in pairs. The touring car engine is 45-50 horsepower, having cylinders 5 1/2 by 5 inches. The machine is equipped with the now well-known Sturtevant automatic centrifugal clutch transmission giving three speed changes.

The Page air-cooled runabout was on view at the stand of the Page Motor Vehicle Company, of Providence, R. I. This is a smart looking car, with 10-horsepower, air-cooled motor-in-front 4 inch by 4 inch, and individual clutch transmission and

shaft drive. The wheelbase is 84 inches and the wheels 28 inches in diameter, with 3-inch tires.

The Shawmut 40-horsepower gasoline car was shown by the Shawmut Motor Company, of Boston. This new machine is likely to meet with more than local appreciation. It is built along Panhard lines in its power equipment, and is strongly made.

Facts of the Successful Show.

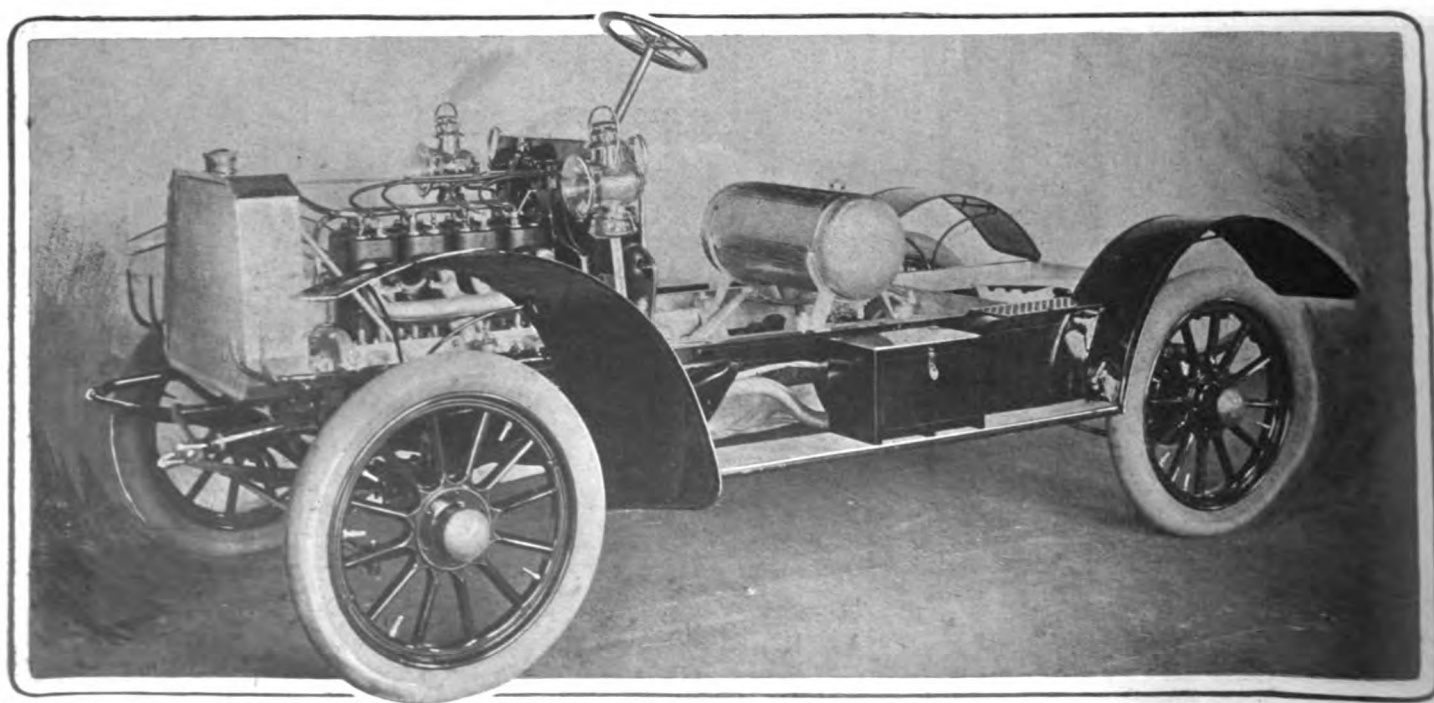
When the doors of Mechanics Building and Symphony Hall closed at ten o'clock Saturday night the most successful automobile show ever held in this city and the greatest automobile and power boat exhibition that has yet taken place in America was brought to a close. From whatever

point of view it is considered, the Boston show of 1906 was an immense success. The attendance was far larger than at any previous exhibition, it being estimated that approximately 175,000 people passed the ticket-takers in the course of the seven days on which the halls were open. This enormous attendance was in the face of the fact that on one day and evening there was a raging blizzard. Every day the halls were crowded from 10 o'clock in the morning until 10 o'clock at night.

But the gratifying part of the heavy attendance, to the exhibitors at least, was the presence in the throng of a large number of buyers. Many a dealer sold practically all the cars he can obtain from his factory for the season, and his only worry at present is the question of deliveries. Dealers who are not sold out have booked enough orders to keep them busy, and they have interested enough prospective customers that they are not worrying about disposing of all the machines they can get hold of. The Boston show has always been noted as one of the very best in the country for sales. This reputation is due no doubt in part to the fact that it comes so near the selling season; but it is also due to the enthusiasm among Boston people for automobiles.

Makers Pleased and Entertained.

Manufacturers who came to Boston from Chicago and the succeeding local shows, expecting to see Boston a repetition of what they had encountered in Philadelphia and other cities, went away to-night with only praise for Boston as an automobile center and for the management of the Boston show. They were loud in praise also of the manner in which they had been treated outside the show buildings, by the local clubs, the Bay State Association,



CHASSIS OF GROUT FOUR-CYLINDER GASOLINE TOURING CAR EXHIBITED AT THE BOSTON SHOW.

which kept open house in quarters in the Copley Square Hotel, and the Massachusetts Automobile Club, which entertained its friends in its clubhouse, near the show buildings.

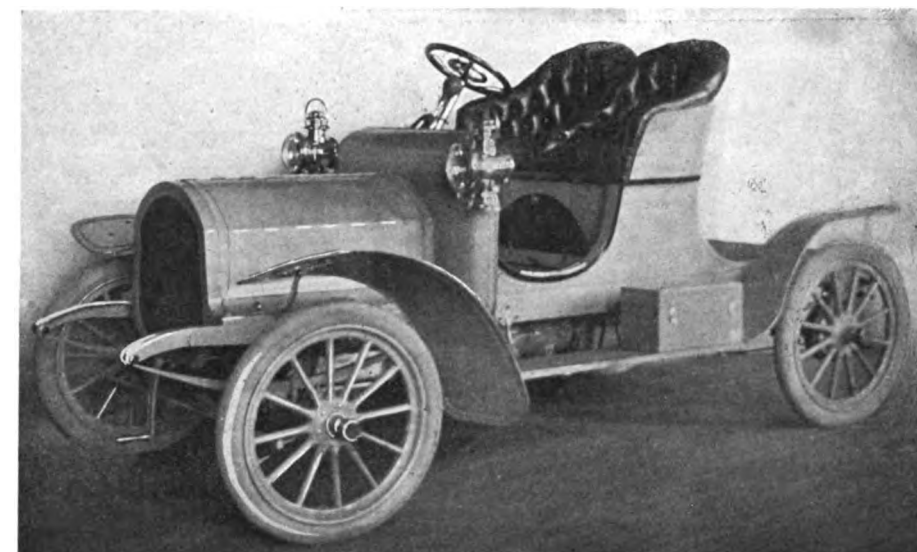
Statistics of the Event.

A census of the show indicated that it was by far the largest, not only in the number of exhibitors, but also in the number and variety of cars exhibited, that has yet been held in this city. There were in the two show buildings a total of 317 motor vehicles and 85 boats. The corresponding figures a year ago were 192 and 67.

Of the total number of vehicles on exhibition there were 271 with gasoline motors, divided as follows: Fifty-five chassis, 122 touring cars, 49 runabouts, 23 limousines, 9 commercial vehicles, 11 motorcycles and 2 racing cars. The increase was mainly in touring cars and runabouts, and there were about twice as many chassis as at the show in 1905.

In the electric class the gain was also very noticeable, there being 25 electric vehicles on exhibition as against 9 a year ago. The electrics were divided as follows: One touring car, 12 runabouts, 5 limousines and 7 commercial vehicles.

There were the same number of steam cars on exhibition this year as was the case in 1905, there being 21 steam vehicles at both shows. It was noticeable this year, however, that more makes of steamers were shown than usual. Of the steamers



PAGE 10-HORSEPOWER AIR-COOLED RUNABOUT WITH INDIVIDUAL CLUTCH TRANSMISSION.

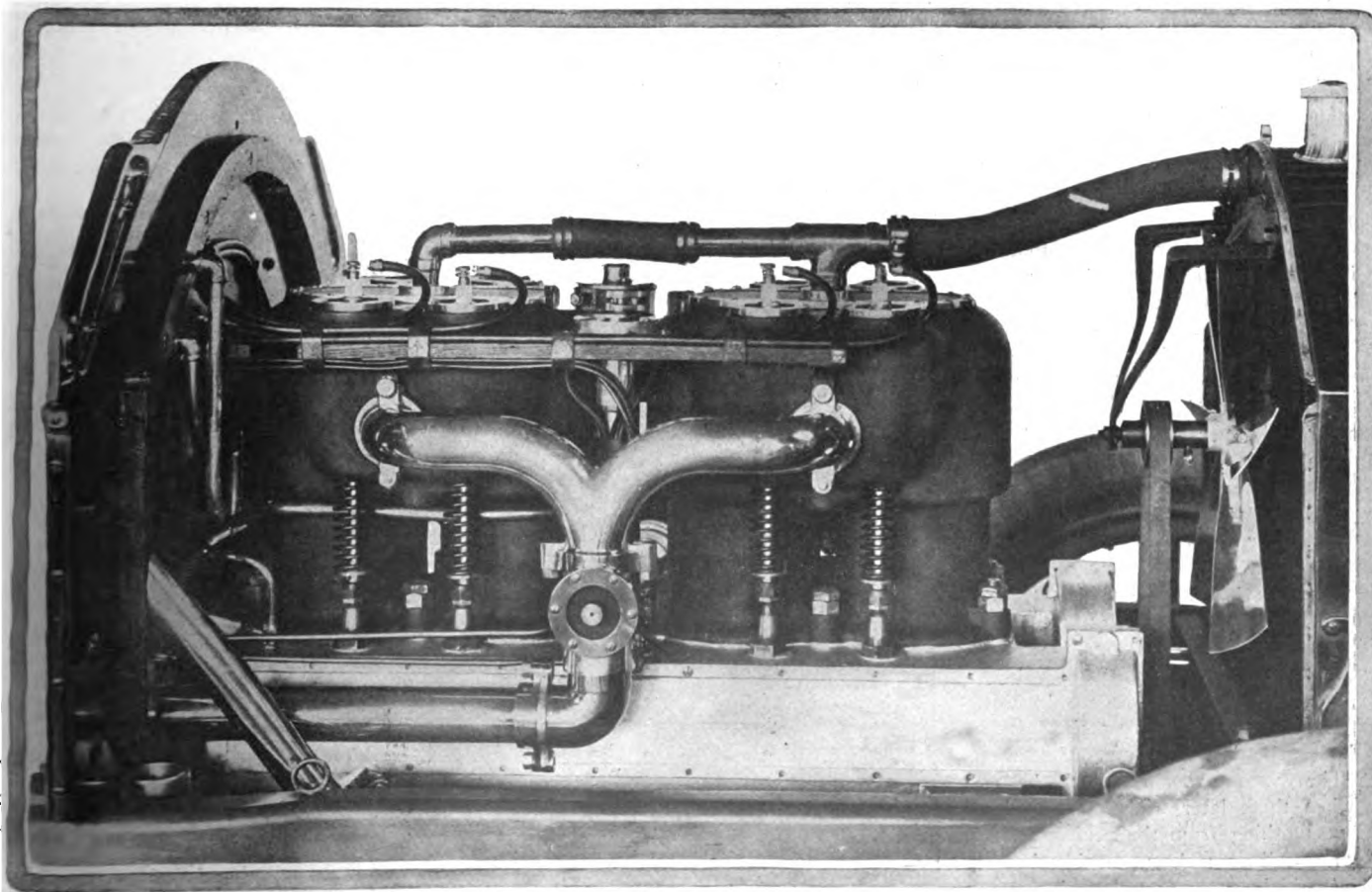
in the show 8 were touring cars, 6 runabouts, 5 limousines, 1 racer and 1 chassis.

Harmony in the Management.

More than one automobile dealer who had followed the show circuit through from New York remarked upon the ever-present harmony between the exhibitors and the management. There was not a hitch all through the show. Every facility was provided for getting the cars into the spaces quickly and without trouble, and

when the cars were on exhibition the management was constantly on the watch to provide for the wants of the exhibitors.

There was some grumbling on the part of exhibitors who had to take places in Symphony Hall, but they had only themselves to blame for putting in late applications, and the management certainly did all in its power to provide attractions to draw a crowd. In the daytime this hall was not so well filled as the other, but in the evenings there were very large crowds.



INLET SIDE OF FOUR-CYLINDER 45-50-HORSEPOWER ENGINE OF THE STURTEVANT 1906 MODEL TOURING CAR.



THE MOTOR MART, PARK SQUARE, BOSTON, OCCUPIED AS SALESROOMS AND GARAGE BY A SCORE OF AUTOMOBILE CONCERNS.]

A Winner and a Loser.

BOSTON, March 17.—After the finish of the automobile show interest in this city centered in a hill-climbing contest between a 36-horsepower Maxwell and a 40-45-horsepower Jackson. The trials took place on Parker's Hill, which is about one-third of a mile long, with a twenty per cent. grade, on Sunday afternoon, March 18, as the result of a bet between C. W. Kelsey, of the Maxwell-Briscoe Company, and E. P. Blake, the Boston representative of the Jackson Automobile Co., as to the respective merits of their cars.

It was necessary for Mr. Kelsey to get a four-cylinder Maxwell to Boston in time for the hill climb, and he also wagered that he could drive it from Tarrytown, N. Y., to the Hub in less than twenty-four hours. This bet he lost owing to tire troubles and heavy, snow-laden roads, but he won the climbing contest.

Parker's Hill was covered with a foot of snow in places which had not been trampled down. Best two out of three trials were the conditions of the contest, and the driver of the Jackson lost the toss and started up the hill first with three members of the Chronograph Club, of Boston, who acted as official timers, and negotiated the ascent in 1:38 2-5. The Maxwell followed, carrying the same timers, in 1:30 1-5, and also won the next heat and the wager.

Of much interest to the spectators was a second contest over the same course in which there was better time made. H. E. Wilson, in a four-cylinder 35-40-horsepower Rambler, defeated A. R. Bangs in a 20-horsepower Franklin. Each won a heat and a third trial was necessary. In this heat Wilson's time was 1:26 2-5, the fastest made during the day, and Bangs' time was 1:28. The course was in much better shape when these later trials were made; it detracts nothing from the performances of the Maxwell or Jackson, as they broke the road which was covered with snow, and was badly drifted at one of the turns.

A. L. A. M. Obtains Rates.

Early in April the new reduced freight rate on automobiles, west of Chicago, which has just been granted by the Western railroads, will go into effect. The new rate amounts practically to a reduction to a rate and a half on travel from Chicago to San Francisco and return, and is the result of extensive negotiations by the traffic department of the Association of Licensed Automobile Manufacturers. The new rate will, of course, benefit all those going from New York or any point east of Chicago. The idea involved in the new tariff is to afford a lower round-trip rate on single machines belonging to tourists, so that it will be an inducement for them to take their cars with them. No car will be allowed the reduced rate eastward to Chicago unless the full tariff has been paid on it going west and it has not changed ownership in the meantime.

The Hon. C. S. Rolls, of London, Eng., has entered a balloon for the Gordon Bennett Aeronautical Cup race to be held on September 30.

The Deductions of "Osk."

Long Island, the scene of the Vanderbilt cup race and the home of many prominent automobilists, is assimilating the automobile perhaps more readily nowadays than any other section of the country. Here's a story from the New York *World* well worth retelling:

Roadmaster "Osk" Jayne, of Old Field, with characteristic Long Island long-headedness, reckoned early "as how" he felt automobiles had come to stay, "an' how the village might jest as well git ready and provide good roads." All hands voted for the good roads, and afterwards declared that Roadmaster Jayne was doing his work well; but discontent by a few began to manifest itself with the first flight of spring's autos.

"Them devil-wagon folk will be owning the roads shortly, I figure," said one anti-auto taxpayer.

"Well," answered the layman and supporter of Roadmaster Jayne, "Osk is going to keep them New York millionaires here by giving them good roads and allowing them to use automobile wagons over them. We couldn't boast much of money in these parts until the millionaires came, and if good roads means them staying, then I stand with our roadmaster."



ROSS 25-HORSEPOWER STEAM CAR EXHIBITED AT THE BOSTON SHOW.

The Reasonable Utility of the Tri-car.

By T. K. HASTINGS.

Having once tried the tri-car, or motor chair as it is sometimes termed, the most broker's charges in and out, a total of \$7 while it was held under bond.



A STOP IN FLORIDA FOR ORANGE SAMPLING AND PHOTOGRAPHING.

skeptical are at once convinced of its capabilities and the extreme ease with which one travels over rough surfaces without jolts or engine vibration. On a level surface the motion is not unlike sailing on absolutely smooth water. The maintenance is much less in proportion than that of any automobile runabout, and it answers the same where the roads are fair. But who wants to ride for pleasure on bad roads? To carry it with you, jumping through the country, the charges are less than horse hire. The fuel consumed equals from 1-3 to 2-3 cents per mile for two passengers.

Another thing to its advantage is the little care necessary to keep it in readiness for immediate use. Oil and fuel tanks full, with an occasional glimpse at the chains and batteries, it seldom refuses to "mote."

This is the summary of expense incurred by taking my tri-car on the recent Southern racing circuit, during which my cyclometer registered over 800 miles: Freight from New York to Ormond, Fla., \$5.90. Here I made a stop of two weeks, riding in the neighborhood of 600 miles. The garage charges were none, having run it under cover only when the weather was wet and other times leaving it on the drive. Consumed about ten gallons gasoline, \$2.50. Crated again and sent to Miami, at a cost of \$5.36. Here I unpacked and stored the crate, giving a negro freight handler some loose change to keep it until wanted. Two gallons of gasoline, 25 cents a gallon, was the expense here.

After exploring all the least resemblances of roads here, checked it, without cost, as baggage on the P. & O. steamship to Havana, not being manifested, I had no consular charges, and merely had to pay custom



MR. AND MRS. T. K. HASTINGS IN CUBA.



THE HOSPITABLE HOME OF THE AMERICAN CONSUL IN MARIANAO.

For the eight days' stay in Havana the garage charges were \$2.50, while 2 1-2 gallons of gasoline, 50 cents a gallon, was the full amount expended. The only mechanical difficulties were easily remedied: One puncture (someone kindly stuck a knife through the rear tire while crated) was patched in a few minutes. Lowered the gear and adjusted the chains twice. Back to New York by steamer, the cost was \$12.

This gave a total cost of \$37.36 for five weeks' use, in which we covered more than 800 miles, at a rate less than two persons can travel by any other conveyance which will enable one to enjoy the country as we saw it.

THE F. A. M. DOING THINGS.

Without any great flourish of trumpets, the Federation of American Motorcyclists, which is steadily growing in strength and influence, has been "doing things" of late. Due to its quiet efforts motorcycles have been exempted from the several automobile bills introduced in the New York Legislature, and even in the case of the radical Frelinghuysen bill in New Jersey, has obtained a number of substantial concessions as the result of several interviews with the senator himself.

In the racing department, Chairman Roland Douglass and colleagues are engaged overhauling the rules; reductions in the costs of sanctions and registration are among the changes. Meanwhile alliances have been formed with the Amateur Athletic Union and the National Cycling Association, which means "suspension by one, suspension by all."

In the matter of tours, Chairman Toepel, of the Roads and Tours Committee, has just announced that awards of gold medals will be made for the greatest mileage during the year and for the member visiting the greatest number of counties in the United States during the twelve months. The conditions are included in the "F. A. M. Member's Diary," which is now being distributed and which contains blank forms for daily record of mileage, cost of fuel, etc.

Road Directions Through the Norwalks.

By ROBERT BRUCE.

WHO that has made the run from New York eastward along the Connecticut shore line to Stamford, Norwalk, Bridgeport and New Haven, does not remember the superb cluster of New England villages collectively called "the Norwalks"? Only a few minutes after passing through Stamford you come to the little town of Darien, and a few minutes farther on you are at the top of a considerable hill which overlooks, slightly to the left, the old city of Norwalk; to the right, South Norwalk, the principal railroad point, and beyond that, East Norwalk.

Through Norwalk and between West

the principal routes in the district of which Old Norwalk is the center. Connecticut avenue is seen to join West avenue, which comes to an end in the very center of the city. Here a right turn on Wall street, crossing the viaduct over the Norwalk River, brings the automobilist to the point where all local runs on the east side of the river diverge. North through Main street, past the Winnipauk Railroad station and the Winnipauk and the Norwalk mills, is the route to Wilton, Danbury and many interior Connecticut points.

Following up the same way as far as Tindall street, a left turn across the rail-

to its intersection with Winfield street and driving out that thoroughfare by way of Saugatuck. At Saugatuck the other road to Bridgeport will be met.

East Norwalk, while not so well known as Norwalk and South Norwalk, has still some interest for the tourist. If the tourist will cross the river from Wall street, to East Wall street, and drive down East avenue to Winfield street, then, instead of turning east out Winfield street, will continue almost due south on the Gregory boulevard, he will be led to Gregory Point, a pleasure resort that is well worth a short detour if one has the time. On the west side of the river West avenue leads direct into Main street, South Norwalk.

In addition to this route, the map shows the connection between South Norwalk and the shore at Rowayton. It will also be seen how one can reach the Rowayton district from the Stamford road by turning right at the outskirts of the city and continuing down Rowayton avenue.

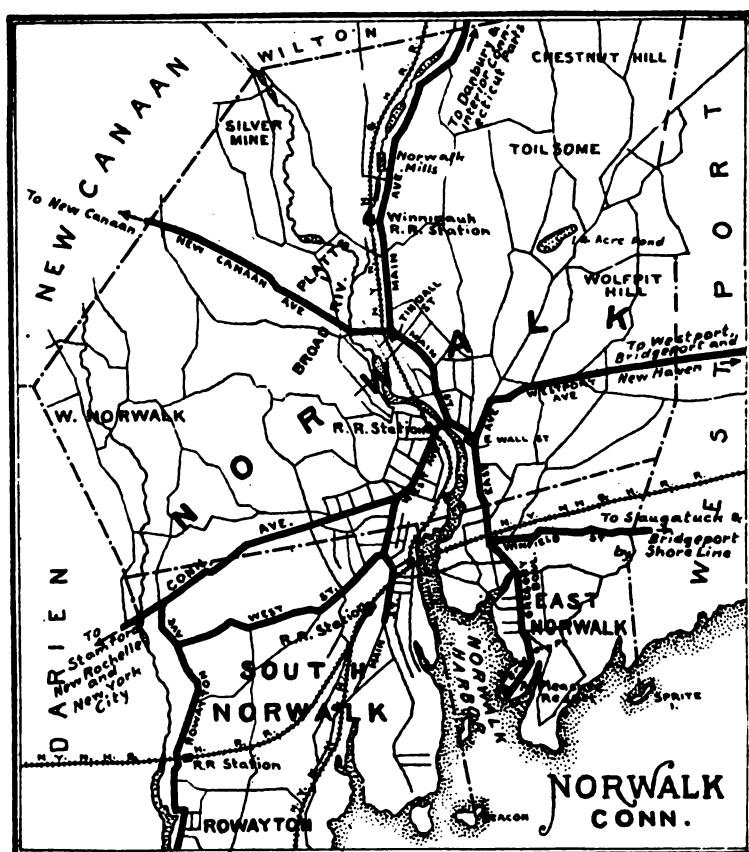
As a matter of fact, anyone looking for a combination of fine old New England scenery, including points on the shore and fine hill country within very short traveling distance of each other, can find them at "the Norwalks," which is one of the most interesting and picturesque localities on the shore line between New York and New Haven.

Novel Wisconsin Garage.

DELEVAN, Wis., March 19.—Probably the oddest combination in the way of a garage is found in this city. There is a substantial brick building well adapted to the storing of automobiles. In the front on one side are the quarters of the man who sells automobiles and repairs them. Still another man on the same floor repairs sewing machines and bicycles. Across on the other side is a horse medicine factory, all on the same floor. Down in the basement is a boat shop. All of these people have been working in peace and harmony, but that is not all. Over a year ago the city school building burned down, and the authorities were short of room for the classes. They were housed about town in all kinds of buildings. The high school class of the town was tucked away on the main floor of the aforesaid garage, so that people were selling and mending machines of three kinds, concocting horse lotions, planning boats, and studying algebra, Latin, Greek, and history, all in the same building, and all within hearing of each other.

There is now a movement on foot to greatly improve the roads in six townships of the county. According to the state law each township may build a mile of graveled road, and if the six townships make a start, all of the others in the county will follow.

The Yacht Club de France is promoting a race for fishing boats fitted with internal-combustion engines, to be held in the St. Malo bay at the end of August.



MAP OF THE NORWALKS, CONN., SHOWING MAIN TOURING ROUTES.

Norwalk and East Norwalk there is the picturesque Norwalk River flowing into the harbor, which is itself an arm of Long Island Sound. From this hilltop the view is probably the most superb on the entire shore road from New York to New Haven; straight ahead stretches Connecticut avenue, opening into West avenue, a broad, well-kept thoroughfare characteristic of the best of its kind in New England. Descending the hill with care, and following this route into the city, the automobilist instinctively halts in front of the fine old Norwalk Hotel, and if time be not too much of an object, short excursions in this vicinity are well worth while.

The accompanying map gives at a glance

road tracks, thence on through Broad River and out New Canaan avenue is the line to New Canaan. This is one of the fine local runs out from Stamford, as many tourists who are acquainted with that section will recall. In fact, some of the best of Connecticut touring is easily accessible north and west from Norwalk.

Going to Bridgeport by the most-used route, the tourist bends right after crossing the viaduct to East Wall street, thence left to the intersection with Westport avenue and out that thoroughfare. Participants in the Endurance Run to Boston and return in October, 1903, will easily call this locality to mind. An alternate route to Bridgeport may be traversed by turning south on East avenue

The Automobile Legislative Mill.

New Jersey's Drastic Measure May Be Modified in Assembly— What Is Taking Place at Albany.

TRENTON, N. J., March 19.—Three weeks remain before the adjournment of the New Jersey Legislature. The Frelinghuysen Bill, which recently passed the Senate with only two dissenting votes, is now awaiting the action of the House. It is expected that there will be no such unanimity in this legislative branch, and the associated automobile clubs of New Jersey will make a most vigorous objection to the passage of the measure.

The basis of all the objections may be summed up in that the bill is too drastic. However, legal advisers for the opposition to the bill may raise several constitutional objections. There are also these objections: That its title fails to express its scope and meaning; that it creates new offices at additional expense to the state; that it imposes new duties on the road department; that it provides for the raising of revenues, thereby transcending the constitutional powers of the Senate. Should the bill be taken into court there are other weak spots that will crop out.

Amendments galore are looked for in the House, and it is predicted that Senator Frelinghuysen, father of the bill, will hardly recognize it when it is returned to the Senate. It may be that the enacting clause will be stricken out. There is little chance for adoption in its present shape.

It is becoming the general opinion that automobile legislation this year is superfluous, as it is argued that the law passed by the last sessions will cover all needs, if properly enforced. Then again it is claimed the law now on the statute books has not been given a fair trial and that it should at least be given another chance, with honest effort to enforce it.

What Is Doing at Albany.

ALBANY, N. Y., March 17.—Senator L'Honniedieu's bill to tax automobiles is in the Senate committee on taxation, and the senator is considering an amendment to exempt the auto-cabs and hansoms of New York city.

The Assembly committee on general laws has reported the ridiculous bill of A. E. Lee, of Lockport, who introduced it as an amendment to the section of the state motor-vehicle law, which now provides that the driver of a restive horse may signal an approaching motor vehicle to stop. This amendment of Assemblyman Lee requires that every auto or motor vehicle operator who shall meet a horse or horses or other draft animal being driven or led along the highway shall reduce the speed of his machine to a mile in six minutes when he arrives within twenty rods of the aforesaid animal or animals; if then the

animal or animals show signs of fright he must come to a full stop within ten rods of it, unless the rider, driver or leader of said animal shall kindly vouchsafe to nod his head or wave his hand as a signal that the motor vehicle man may proceed upon his journey. Of course a failure to comply with this new requirement and strictly observe the twenty- and ten-rod limits subjects the automan to all the penalties provided in the law for such violation.

The Cox bill to permit owners of motor vehicles when arrested to give a security company bond in lieu of leaving the cash or his machine behind as bail has passed the Assembly and is now in the Senate.

Sims Bill to Have Hearing.

WASHINGTON, D. C., March 19.—The automobilists of this city are nursing the fond hope that the Senate committee on the District of Columbia will lay away the much-talked-of Sims automobile bill in the limbo of things that were. After the bill was passed by the House, as reported in THE AUTOMOBILE, it was referred to the Senate District Committee, and that august body will gain the good-will of the entire automobile fraternity if it allows Representative Sims' pet measure to sleep undisturbed in the committee's files.

Responding to the pressure brought to bear upon the committee, Senator Gallinger, the chairman, has consented to grant the automobilists a hearing, and has set March 30 as the day. Representatives of the Automobile Club of Washington will appear before the committee and make a strong argument against the bill, backing it up with a lot of figures bearing on the subject. Senator Gallinger has taken a great interest in the fight the club is waging against the notorious Sims bill and has promised to aid the club in every way.

One of California's Tax Methods.

LOS ANGELES, CAL., March 15.—California has a law on its statute books that provides for a tax on all vehicles, and the city assessor of Los Angeles has decided that all automobiles within the city's jurisdiction, whether the property of residents or visitors, comes within the intent and scope of the law. E. R. Thomas, the Buffalo manufacturer, who had one of his "Flyers" shipped to southern California for use while sojourning there, fell under the watchful assessor's gaze, and was asked to pay \$33.60 tax for the privilege of running the machine. He paid the tax under protest and immediately engaged counsel to contest the assessors' interpretation of the statute. Mr. Thomas has determined, if necessary, to carry the case to the Supreme Court of

California. His main contention is that as he pays tax on all his cars at Buffalo, where they are made, as personal property, they cannot be assessed legally in another state.

REGISTRATIONS IN NEW HAMPSHIRE

Automobile owners of New Hampshire would doubtless be interested in a booklet issued by the Secretary of State of that commonwealth which contains in addition to a list of the registered car owners to February 1, 1906, and the make of machine owned by each, the full text of the New Hampshire registration law which went into effect on May 1, last year. There are also printed in it the blank forms for applications for owners' and chauffeurs' licenses and reproductions of the certificates issued upon registration to owners of automobiles and motorcycles, to manufacturers and dealers, to operators and to professional chauffeurs, the law providing for five different certificates.

Up to March 15, 1906, the Secretary of State had issued 722 certificates for cars registered, 98 for manufacturers and dealers, and 64 for motorcycles.

AUTOMOBILIST NOT AT FAULT.

A verdict of "no cause of action" was returned on February 28 last, in the Supreme Court of New York, at Coopers-town, N. Y., in the case of Reynolds vs. Baird. The suit was brought by Mrs. Francis J. Reynolds against George B. Baird, of Oneonta, for an accident that occurred September 17, 1904. On that date the defendant was driving a Pope-Toledo accompanied by his wife, when, as they were approaching a bridge spanning the Susquehanna river, a team coming across the bridge became frightened and caused the wagon it was hauling to collide with a bridge post, throwing out and injuring the three occupants. The plaintiff in the case, who was the most seriously injured, was riding with the owner of the team. The evidence showed that the driver of the automobile was not responsible for the accident.

PHYSICIANS AS AUTOMOBILISTS.

AURORA, ILL., March 19.—In the larger towns near Chicago there is a big advance order for automobiles. At this place a carload of Ramblers has been received and more are coming. They are handled by the Anderson Garage Company. Several White steamers will be received shortly.

Probably in no other town in Illinois are autos used so generally by the doctors. Nearly every physician in town now has a power runabout of some kind.

The annual meet of the F. A. M. will be held and the national championships will be run, probably in July, in either Rochester, New York, or Chicago. Both cities have extended formal invitations, and the choice will be decided by mail vote of the F. A. M. Executive Committee.

Trip of the Strang Car.

KANSAS CITY, MO., March 17.—The big Fischer system sight-seeing cars in New York gave W. B. Strang, of Kansas City, the idea that a gasoline-electric car, on rails, would be a good investment for the system of interurban lines which he has projected and partly built out of this city. He followed up the idea, and, finding that the Fischer company was prepared to construct a car after his idea, awarded that firm a contract.

Before the car was finished the Fischer company became involved in difficulties. Mr. Strang, however, secured an order from the courts permitting him to continue the work, and the car was finished in the J. G. Brill shops in Weehawken, N. J. March 13 the car arrived in Kansas City, having made the journey half way across the continent under its own power. Since its arrival it has been laid up at the Union Station and inspected by an interested throng, which included experts from several railroads now building motor cars for some of their lines. The car came from St. Louis in two days over the Rock Island's new line, open only a year. From St. Louis it made the run to Eldon, Mo., 160 miles, in one day, and, remaining there over night, made the remaining 139 miles fast enough to arrive here shortly after 1 o'clock. On the trip from Eldon an average speed of thirty miles an hour was maintained. Mr. Strang proposes to take the car on to the Pacific coast, as his lines here will not be ready for operation until June or July. However, he will probably wait until the snow is off the ground and the roads in better condition to travel. Snow blockades have been plentiful lately in the West.

The car brought here is not the standard size intended to be used on the road. It is more in the nature of a sample. While the standard car is to be 52 feet 9 inches long, this model is only about 25 feet. It comprises the motor and smoking compartments only of the complete car.

The six-cylinder motor of this car is 72 horsepower, although the standard car is to have 170 horsepower. It weighs 78,000 pounds, while the standard model is to weigh only 74,000 pounds. The drive is to the front truck only, each axle carrying a 50-horsepower motor, geared direct, as in approved electric railway practice. The control is by street railway controllers. Air brakes are fitted.

Those who made the trip from Weehawken were W. B. Strang, president; A. F. Hunt, Jr., vice-president; Lars Wilson, engineer; F. S. Loomis and E. J. Edwards, mechanical engineers, and J. A. Vandergrift.

MOTOR RAILROAD CARS IN KANSAS

KANSAS CITY, March 17.—Interest in motor cars for railroads continues. A line has been projected from LaBelle to Shel-

bina, Mo., which is to use cars of this type. The tractor is planned to be sufficiently powerful to haul six freight cars of standard size on fair grades.

The Union Pacific Railroad Company has announced that it will soon equip the new Topeka & Northwestern railroad, running from Topeka, to Marysville, Kans., with two gasoline motor cars. It plans to have each car make a round trip once a day. The cars are said to be almost finished in the Union Pacific shops in Omaha.

The new line to Olathe, Kans., sixteen miles out of Kansas City, is planning to use gasoline-electric cars, built by a Mr. Nilson, of New York. The builder of the line, which is about one-third finished, announces that the first car will be run from New York under its own power. The road, so far as it has been constructed, has only slight grades and should be well adapted for this method of conveyance.

FLORIDA'S SELF-PROPELLED COACH.

JACKSONVILLE, FLA., March 15.—A self-propelled railroad passenger coach is to be put in service on the Florida East Coast Railway in a few days on the Mayport division. The coach is now in the railroad shops at St. Augustine. It is built on the Gauz system, which has been developed in Austria. The motive power is steam, the boilers being equipped to burn solid fuel, and the drive is direct by gears to the driving axle. The car is 43 feet in length. There is seating capacity for thirty-eight passengers and the car will be capable of a speed of about forty miles an hour. It will be used chiefly in providing transportation for guests of the Continental Hotel at Atlantic Beach.

NEED NOT PAY FOR CAR.

INDIANAPOLIS, March 19.—A unique decision was handed down in the United States Court here last week, when it was decided that Gordon Varney, of Indianapolis, need not pay a note of \$2,000 he had given for an automobile, he claiming that the automobile had not been satisfactory.

Varney bought a car from the Kensington Automobile Company, of Buffalo, and gave a note for \$2,000, which was later sold to a Rochester, N. Y., bank. When the bank sued for payment, Varney asserted the machine had been worthless and that he had returned it. The automobile company is no longer in business.

Lozier Admitted to A.L.A.M.

The Lozier Motor Company, of New York, has been admitted to membership in the Association of Licensed Automobile Manufacturers, and granted a license to make gasoline automobiles under the Selden patent, after having paid back royalties and the initiation fee of \$2,500. The A. L. A. M. now numbers thirty-eight licensees.

That Three-Year Guarantee.

PARIS, March 10.—Discussion has been aroused among European automobile manufacturers by the announcement of S. F. Edge that the Napier firm would give a three years' guarantee with every machine and assure prompt delivery, under a penalty of \$1.00 for every week's delay on the specified date.

French constructors have shown great interest in the announcement, but are not likely to follow the Englishman's lead, either in giving a guarantee of three years or assuring prompt delivery.

Messrs. Brasier, Girardot, Serpollet, Darracq, and Charley are all unanimous in declaring a guarantee impossible. The present guarantee of six months given by all French builders, and limited to the replacing of any part showing defective construction, is claimed to be all that can reasonably be expected. The life of a car depends so much on the manner in which it is treated by the owner or his chauffeur that it is impossible, declare the Frenchmen, to give a guarantee other than that at present accorded. If the Napier firm can do it, it must be because the probable cost of such repairs has been included in the selling price of the car, insinuate the Continental rivals.

On the question of prompt delivery, the Frenchmen's position is not quite so strong, and although most of them declare that there are too many outside influences to make a fixed date possible, and the trade still in too prosperous a condition for construction to needlessly hamper themselves in this manner, there is a feeling that such a method is not beyond the range of practicability. M. Darracq declares that although he would not inaugurate such a system, if any of the French constructors undertook to deliver at a fixed date under a penalty, he would not hesitate to do likewise. Such a step would necessitate an increase of machinery, but the capital so expended would give a sufficient return to cover the indemnities which might be incurred.

AUTOMOBILIST SUING RAILROAD.

WILMINGTON, DEL., March 19.—One of the most interesting automobile suits ever tried before a Delaware court is now pending in the Superior Court in this city.

Dr. William R. Garrett, a local automobilist, is suing the People's Railway Company for damages alleged to have been sustained last May, when his automobile was in collision with one of the company's cars, at Eleventh and Orange streets, and the doctor and a companion were thrown out and the machine damaged. The doctor claims that he was permanently injured. His contention is that the car ran into his machine and was responsible for the accident, while the contention of the railway company is that the automobile ran into the car.

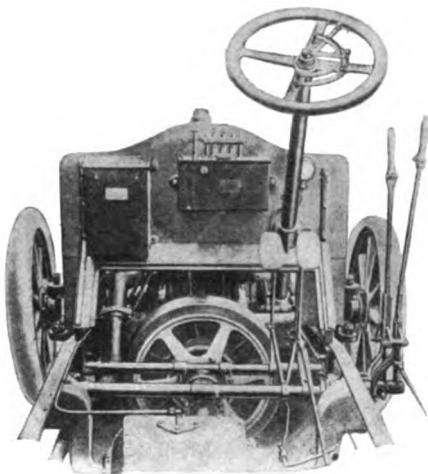
Gobron-Brillie Touring Cars.

A French car that has not heretofore been sold in this country, but which is interesting on account of the peculiar construction of its gasoline motor, is the Gobron-Brillie, the American agency and manufacturing rights for which have been secured by the Hartford Suspension Company, of New York. Cars are now being shipped from France.

The peculiarity of the motor lies in the fact that the four cylinders, arranged in the usual vertical position, have two pistons each, the explosions taking place between the pistons and driving them apart, one upward and the other downward. The cylinders are cast in pairs; the two upper pistons in each pair of cylinders rise and fall together, as do the two lower pistons. The latter are both connected by rods of the usual type to a single crank with a long crankpin. The connecting rods in the upper pistons extend upward into a common yoke, into which they are rigidly secured. The outer ends of the yoke extend beyond the cylinder walls; each end carries a connecting rod, which extends downward, outside the cylinder walls, and works on a crank set opposite the crank on which the lower connecting rods work. When an explosion takes place between the two pistons in each cylinder, the lower piston drives downward on its crank while the upper piston pulls upward on its crank, thus obtaining a balanced action which is said to contribute largely to the smooth running of the engine. Each pair of cylinders is inclosed in a casing which is large enough to in-

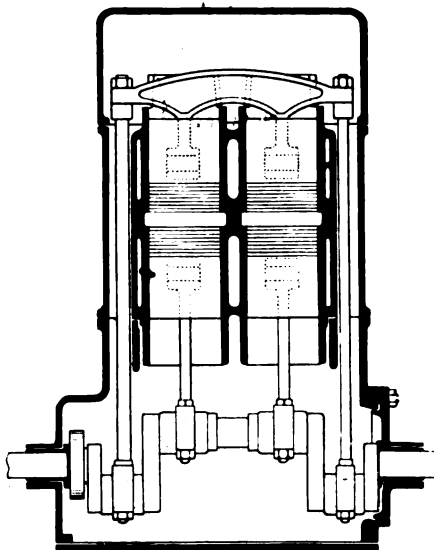
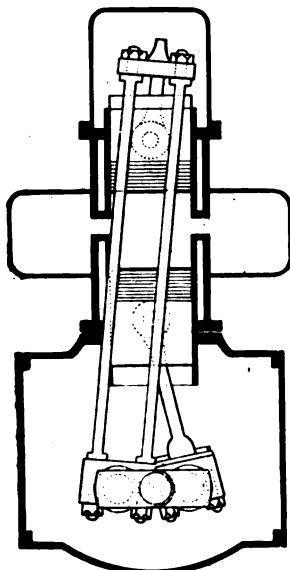
The motor works on the four-cycle principle, the valves being placed so that the inlet and exhaust ports open into the combustion chamber between the two pistons. The valves are mechanically operated and are placed on opposite sides of the cylinders.

Apart from the engine, the Gobron-Brillie car follows current foreign practice in its



FORWARD END OF GOBRON-BRILLIE SHOWING SPECIAL CLUTCH.

general design. The clutch, however, is a departure from the usual cone type, in that there are two concentric cones, the outer having a leather facing of the customary kind, while the inner cone is of bare metal working into a bare metal internal cone. The inner cone is set slightly in advance of the larger cone and slips rather readily when first engaged, allowing the car to start very gradually. The larger cone,



TRANSVERSE AND LONGITUDINAL SECTIONS THROUGH CYLINDERS OF GOBRON-BRILLIE ENGINE, SHOWING DOUBLE PISTONS AND PISTON RODS.

clude the long outside connecting rods and the yoke for the upper pistons, so that the moving parts are all inclosed. The arrangement is clearly shown in the drawing. It will be understood that this shows only two of the four cylinders, or half of the engine, the other half being, of course, exactly the same.

leather faced, follows and takes up the drive after the inertia of the car has been nearly overcome, and when both are fully engaged there is no slipping. It is claimed that the car can be started on the high gear without shock or jar, and can be handled in dense traffic on the high gear without difficulty or discomfort.

A sliding transmission of the selective type gives four forward speeds; the transmission shafts run in annular ball bearings. Final drive is by side chains. A long metal casing extends from the bottom of the radiator back to the rear end of the transmission gearcase, thoroughly protecting all the machinery from mud and dust.

FOR USE IN THE FAR WEST.

One of the most unique cars for practical use ever built in this country is to be constructed at the factory of the E. R. Thomas Motor Company, of Buffalo, N. Y., as the result of an order taken at the Boston automobile show. The order was placed with C. S. Henshaw, the New England representative, by L. M. Hart, of Boston. Mr. Hart has extensive interests in Mexico, and among his enterprises are several gold mines. Ever since these mines were opened there has been trouble with the Yaqui Indians. The nearest railroad is many miles away, and all the gold taken from the mines must be sent there for shipment to the north or the capital. It is the custom of the Yaquis to attack the gold trains, swooping down on the guards in the narrow passes and mountain roads. Although this is in a civilized country, the Mexican Rurales have never found it possible to clear the mountainous region of the Indians, who, on the approach of the troops, fly to their hiding places, to venture out again on the approach of the gold train.

Early in the year Mr. Hart bought two Thomas cars, and after he had given them exhaustive tests, became convinced that automobiles could be used to advantage in the transportation of bullion in Mexico. He took the matter up with Mr. Henshaw at Boston, and as a result the preliminary plans were drawn up. The chassis and larger portion of the body are to be of the regular stock model touring car, but there the resemblance ends. Armor plate will be used to protect the working parts, front seats and tonneau to protect the machinery and passengers from attacks both on level ground and while running through defiles where an attack from above might occur. A place will be provided in the tonneau for carrying gold, and either one or two rapid-fire guns will be mounted in the front and rear compartments of the body.

R. B. McMULLEN'S NEW MOVE.

Roger B. McMullen, who has been acting as general manager of the American Motor Car Manufacturers' Association, has tendered his resignation to take effect April 15. His future connection is with the A. O. Smith Company, of Milwaukee, and he will take charge of the sales, credits, etc., of the company, with headquarters in Chicago. Mr. McMullen states that he leaves the A. M. C. M. A. with much regret.

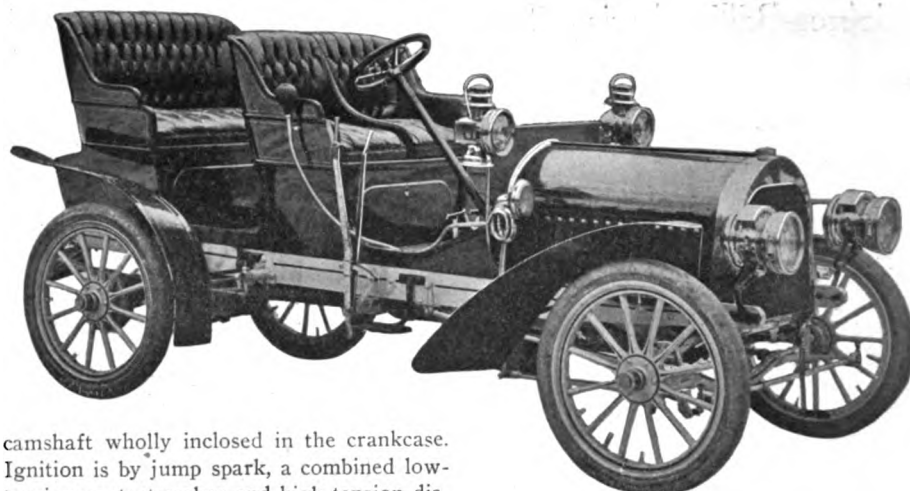
An Importers' Association has been formed in England to watch over the interests of the foreign car importers, in opposition to the British Alliance.

Mora Light Touring Car.

The light car illustrated and described herewith is a machine of a popular class, with high power for its weight and a body that, normally of the runabout type, may be converted into a four-passenger body by removing the "torpedo deck" behind the fixed seat and attaching a surrey seat. The engraving of the complete car shows the surrey seat in position. In general construction the car follows well-known lines, having a four-cylinder vertical water-cooled motor, placed under the bonnet in front, sliding-gear transmission giving three forward speeds and a reverse and final drive by propeller shaft and bevel gears. The frame is of pressed steel, the axles are tubular, the bonnet is round-topped and the radiator of the cellular type.

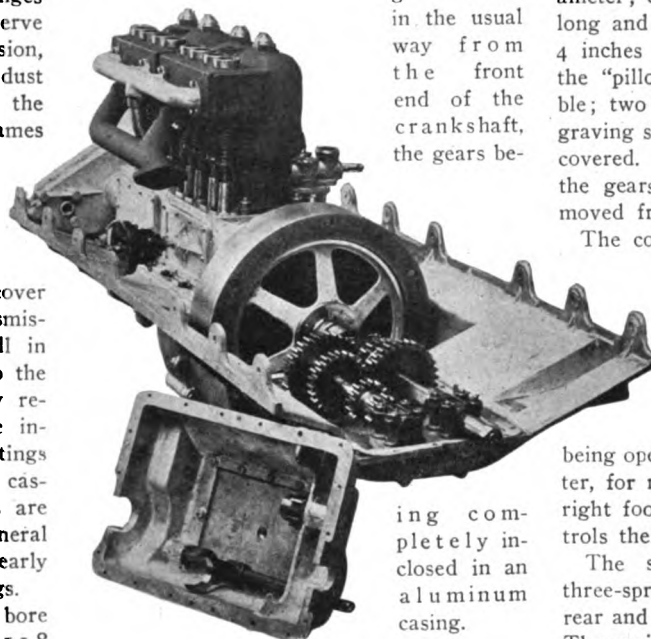
A departure from ordinary practice is made, however, in the mounting of the engine and transmission. Two aluminum castings, bolted together by suitable flanges so as to form a continuous bed-plate serve to support the engine and the transmission, while lateral extensions form mud and dust guards and carry the lugs by which the whole is bolted to the main side frames of the car. The bearings for both engine and transmission shafts are attached directly to the bed-plate with a view to securing constant and correct alignment. The upper part of the engine crankcase, the cover for the sliding gears of the transmission and the lower part of the well in which the flywheel turns are bolted to the main castings; hand-holes covered by removable plates provide access to the interior of the engine and gear castings without the necessity for removing the castings themselves. The main castings are well ribbed, to give stiffness. The general construction and arrangement are clearly shown in the accompanying engravings.

The cylinders of the engine have a bore of 3 1/8 inches and a stroke of 5 1/8 inches, the cylinders being cast in pairs with integral heads, water jackets and valve chambers. Caps screwed into the tops of the valve chambers permit the removal of the valves. All valves are on the same side—the left—and are operated by a single



MORA LIGHT FOUR-CYLINDER CAR, WITH SURREY SEAT REPLACING TORPEDO DECK.

camshaft wholly inclosed in the crankcase. Ignition is by jump spark, a combined low-tension contact-maker and high-tension distributor being placed on a shaft extending through the left side of the crankcase at right angles to the camshaft, from which it is driven by gears. The camshaft is gear driven in the usual way from the front end of the crankshaft, the gears be-



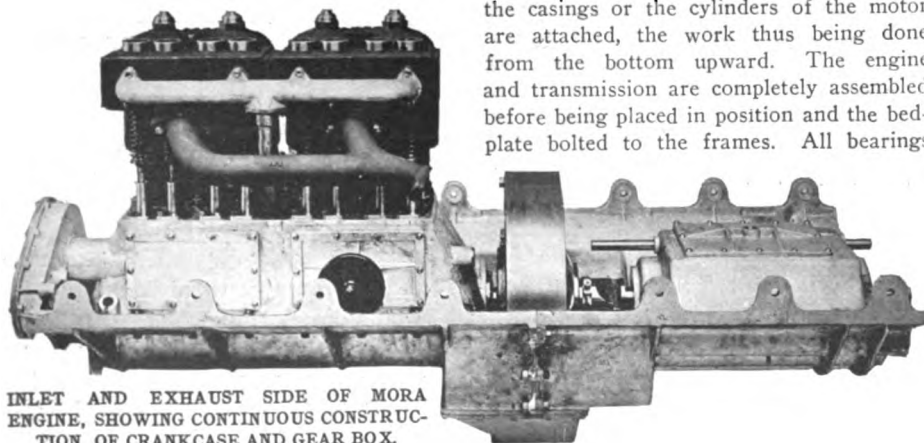
MORA ENGINE WITH CHANGE-SPEED GEAR CASE COVER REMOVED, SHOWING SLIDING GEARS.

ing completely inclosed in an aluminum casing. In assembling the power and transmission plant, the shafts are placed in their bearings and lined up before the upper parts of the casings or the cylinders of the motor are attached, the work thus being done from the bottom upward. The engine and transmission are completely assembled before being placed in position and the bed-plate bolted to the frames. All bearings

are of phosphor bronze. The crankpins and crankshaft journals are 1 5/8 inches in diameter; crankpin bearings are 2 5/8 inches long and the crankshaft bearings are each 4 inches long. All these bearings are of the "pillow-block" type, split and adjustable; two of them may be seen in the engraving showing the transmission gears uncovered. The manufacturers state that all the gears in the transmission can be removed from the casing in fifteen minutes.

The control of the car is by spark and throttle levers placed on the top of the steering wheel. Braking is confined to the rear wheel hubs, which carry drums for internal expanding and external constricting brakes, the former, for emergency use, being operated by a hand lever, and the latter, for regular service, by a pedal for the right foot. A pedal for the left foot controls the cone clutch.

The spring suspension consists of a three-spring platform arrangement in the rear and a single transverse spring in front. The weight of the car is given as 1,700 pounds. The motor being rated at 24 horsepower, this would give approximately 1 horsepower for every 70 pounds weight of the car—ample power for hill work and bad roads. The wheelbase is 98 inches and the tread 56 inches; wheels are 32 inches in diameter and are fitted with 3 1/2-inch clincher tires. Fifteen gallons of gasoline can be carried. Mud guards are wide; there is a small steel step bolted to the frame on each side, no running board being used. Included in the equipment of each car are oil side lamps and tail light, a horn and the necessary tools.



INLET AND EXHAUST SIDE OF MORA ENGINE, SHOWING CONTINUOUS CONSTRUCTION OF CRANKCASE AND GEAR BOX.

Again the price of gasoline has been advanced by the Standard Oil Company, half a cent a gallon being the increase in price. Seventy to seventy-four degree gasoline is now quoted at 14 1/2 cents per gallon, and deodorized stove gasoline at 12 1/2 cents.

Soules Commercial Wagon.

A commercial wagon of a type that possesses a number of advantages for carrying loads up to 1,500 pounds is the gasoline wagon built by the Soules Motor Car Co., of Kalamazoo, Mich., a machine with ample power for hard work, and with a sufficiently high gear to enable it to make fairly quick runs. The car may be had with an open box body, as in the accompanying illustration, or with a closed body; the wheelbase is long for a machine of this class—90 inches—and the wagon has long three-quarter elliptic springs.

The motor of the Soules wagon is of the double-opposed cylinder type, and is rated at 22 horsepower; it is placed under the bonnet in front, with the crankshaft running lengthwise of the car. The flywheel is in front, permitting the casings containing the clutch and the two-speed sliding gear transmission to be bolted directly to the crankcase, the whole making a rigid T-shaped unit. Drive is by propeller shaft and bevel gears.

The engine has water-jacketed cylinders, of 5 1/2-inch bore and 5-inch stroke, and has mechanically operated valves which, with the valve operating gear, are on the top of the motor, where they are easily reached. A single camshaft, running in a housing formed in the upper part of the crankcase, carries two cams, one operating the two inlet valves and the other the two exhaust valves. By removing the cover of the housing the cams and gears are exposed.

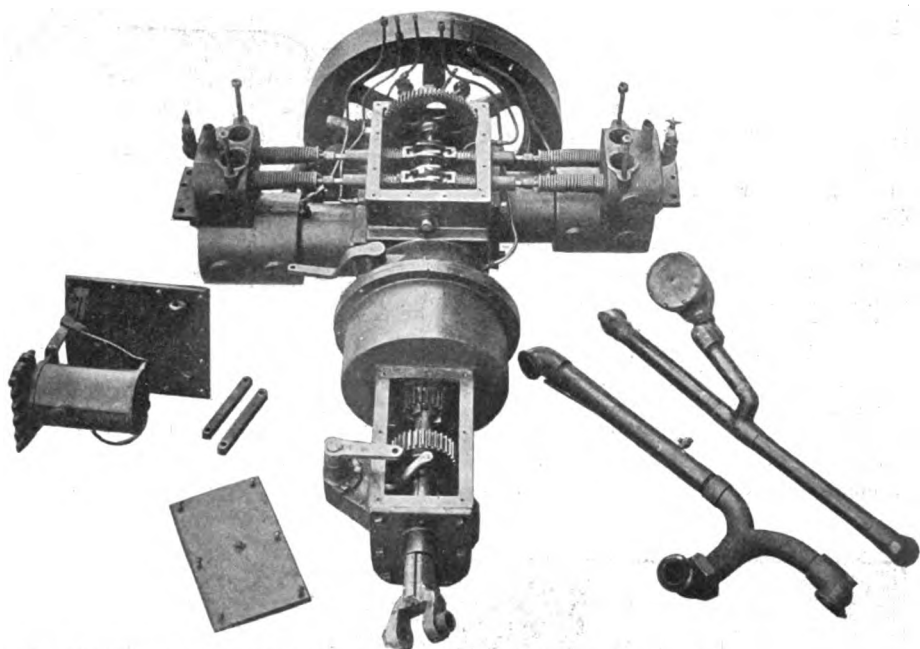
Bolted to the rear end of the crankcase is the cylindrical casing containing the broad-faced cone clutch, which is of comparatively small diameter but obtains the requisite friction surface by its width. Thrust is self-contained when the clutch is engaged, and also when fully disengaged, when the clutch is automatically held out until released.

The sliding gear transmission occupies a

housing, part of which is formed integral with the rear part of the clutch casing. It is exceedingly simple, having a single sliding gear which meshes with a pinion

of the same material, all well braced at the corners by stout gusset plates.

An interesting feature of the Soules ignition system is the timer, which is made



SOULES ENGINE AND TRANSMISSION, WITH COVERS, VALVES AND CARBURETER REMOVED.

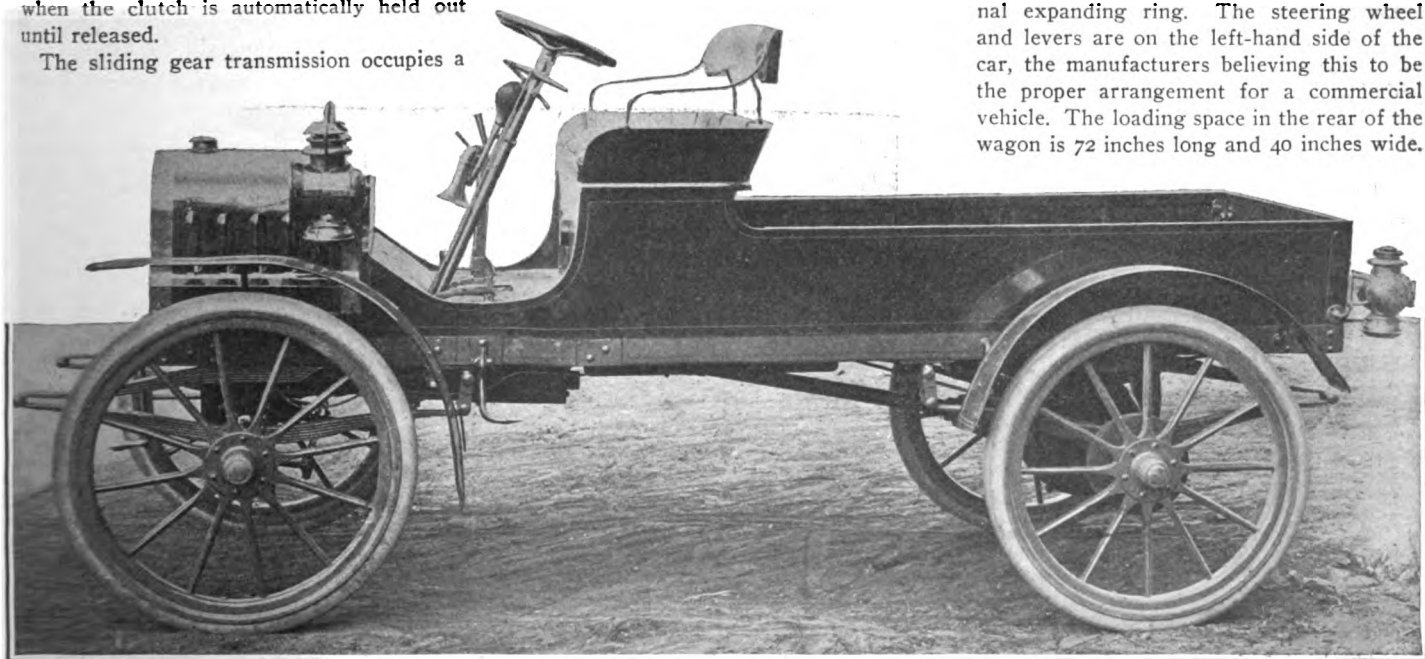
on the countershaft for low speed, with another pinion through an intermediate gear for the reverse, and has a claw clutch which engages with a similar clutch on the shaft for direct high speed drive, while the countershaft runs idle.

The entire system—engine, clutch, and transmission—is hung from three points, two being the ends of the cylinders, which are bolted to the side frames of the car, and the third the rear end of the transmission casing, which hangs from a cross frame.

Angle steel of deep and heavy section is used for the framing, with cross-members

with a view to avoiding the necessity for having loose and swinging wires leading from the timer terminals to the spark plugs. Generally speaking, the timer is of the familiar type, with an outer ring of fiber carrying the contact pieces, against which a rotating arm makes contact as it moves around within the ring; the fiber ring has an arm to which is attached the rod for changing the position of the ring and consequently the time of ignition.

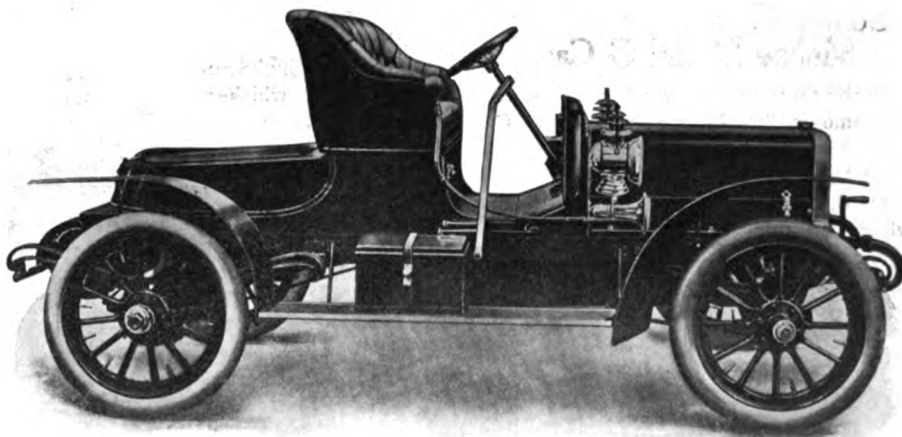
All brakes are carried on the hubs of the rear wheels, a drum on each hub carrying an external contracting band and an internal expanding ring; the external brake is the proper arrangement for a commercial vehicle. The steering wheel and levers are on the left-hand side of the car, the manufacturers believing this to be the proper arrangement for a commercial vehicle. The loading space in the rear of the wagon is 72 inches long and 40 inches wide.



SOULES 1,500-POUND OPEN BOX BODY GASOLINE DELIVERY WAGON WITH 22-HORSEPOWER DOUBLE-OPPOSED MOTOR.

A Royal Runabout.

Among automobilists who want a high-powered car with limited seating capacity the touring car chassis fitted with a runabout body—making what is sometimes called a cross-country car—has attained considerable popularity, and several manufacturers have placed such cars on the market. An excellent example of this type of machine is the Model N Royal, manufactured by the Royal Motor Car Co., of Cleveland, O. The motor is of 40 horsepower and is identical with the motor of the Royal touring car, having four water-cooled cylinders of 5 inches bore and 5 inches stroke, driving through a three-speed sliding gear transmission, with final drive by propeller shaft and bevel gears to the live rear axle. Wheels are 34 inches in diameter and are fitted with 4 1-2-inch tires; the hubs of the rear wheels carry drums for the expanding emergency brake,

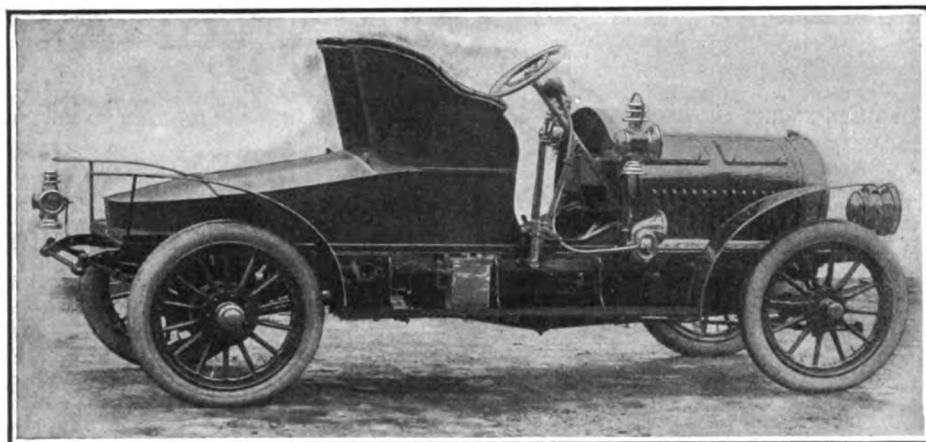


WINTON TOURING-CAR CHASSIS FITTED WITH RUNABOUT BODY AND TURTLE BACK.

match. The running gear is black. Ample provision is made for the comfort of the driver in stormy weather; the top extends well forward and the front may be closed

chauffeur is well protected from the elements. The car was built by the Packard Motor Car Company, of Detroit, Mich.

The Packard landaulet is also built on the regular Packard chassis. In this type of body the hood is collapsible, so that in fine weather it can be folded and the windows dropped into pockets, leaving the car practically open, with standing roof. This makes a car that can be used all the year round, and is a type which is increasing in popularity as the habit of using the automobile becomes confirmed.



ROYAL TOURIST 40-HORSEPOWER CAR FITTED WITH RUNABOUT BODY FOR CROSS-COUNTRY DRIVING.

the regular service brake being on the transmission. The wheelbase is 110 inches. Two headlights, two side lamps, a tail lamp and a horn are included in the equipment of the car.

by a glass screen, which slides to the roof when not in use. With the screen down and the curtains buttoned over the sides the

So successful has proved a private automobile stage operating between Urbana and Mechanicsburg, O., that a large firm has volunteered to place lines of like character between Urbana and St. Paris, Urbana and North Lewisburg and Woodstock and operate cars which will carry from a dozen to eighteen people. In case this scheme is put through, the firm establishing this line will equip a repair shop in Springfield. Progress in the matter will be slow because of the organized opposition to the use of the roads by these mammoth cars, but eventually opposition will die away.

Packard Limousine.

The handsome closed car illustrated herewith consists of a limousine body built on a Packard standard chassis with 24-horsepower motor; the car was recently delivered to its owner, General R. A. Alger, former Secretary of War and now United States Senator from Michigan. The enclosed part is fitted up with all the luxury demanded in a vehicle of this type, having electric light, pockets for stationary, toilet articles and the like, speaking tube for communicating with the driver, and other conveniences. Three persons can find comfortable room on the rear seat and two more on folding seats; the driver's seat will carry two more, making the total capacity seven persons.

The body is finished outside in Brewster green and the upholstery is in leather to



PACKARD LIMOUSINE, ESPECIALLY BUILT FOR GEN. RUSSELL A. ALGER, FORMER SECRETARY OF WAR.

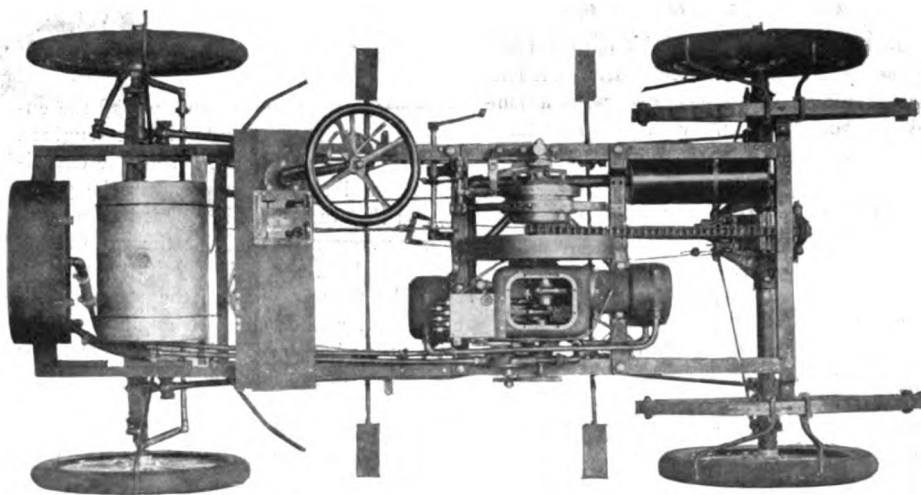
Moline Model G Car.

Of the three models which constitute the 1906 line of the Moline Automobile Co., of East Moline, Ill., two were described in *THE AUTOMOBILE* for December 14 last; these were models A and C, both four-cylinder machines. The third car, Model G, is of a different type, having a double-opposed cylinder water-cooled motor hung under the body with cylinders pointing fore-and-aft, the hood being used to cover the large cylindrical gasoline tank.

The motor is placed close to the main frame on the left-hand side of the car and an extension of the crankshaft, reaching to the opposite frame member, carries the planetary transmission, from which a chain drives the live rear axle. The motor has cylinders of 4.3-4 inches bore and 5 inches stroke and is rated at 16 horsepower; cylinders have integral heads and water jackets, and the valve chambers are entirely surrounded by the cooling water. The spark plugs are placed in the centers of the cylinder heads, where they are not liable to become oiled up. Nickel babbitt is used for the main bearings of the crankshaft, the bushings being split and adjustable.

A centrifugal oiling device is applied to the big ends of the connecting rods, insuring the adequate lubrication of these bearings. A six-feed Hill oiler sends oil to each cylinder, to each of the main bearings and to each of the centrifugal oilers on the big ends. The outboard crankshaft bearing, on the right-hand main frame of the car, is lubricated by a compression grease cup using hard grease.

The frame is of angle steel, with dropped cross members of the same material carrying the engine. The rear springs are full ellipses, while the front end of the frame is carried by a single semi-elliptic spring set crosswise, giving a three-point suspension which, the manufacturers state, has proved very satisfactory. The axles are of



CHASSIS OF MOLINE MODEL G 16-HORSEPOWER TOURING CAR, PHOTOGRAPHED FROM ABOVE.

seamless steel tubing; the live rear axle runs in roller bearings, and the front wheels on double ball bearings, the balls in the outer ring being 1-2 inch in diameter and the balls in the inner ring 5-8 inch.

The body is of the side-entrance type, the tonneau being detachable. The dashboard is flat, and the hood, closed at the front end by the tubular radiator, has a flat top, flat sides and rounded shoulders. Lamps, horn and tools form part of the equipment of every car.

FRENCH MARKET FOR RUNABOUTS.

Despite the pre-eminence of France in the automobile industry, that country offers an excellent field for the sale of American-built runabouts and small cars, writes Consul Goldschmidt, of Nantes, to the State Department. The machine for the business man and the man of moderate means has been neglected by the French manufacturers, who have catered to the wealthy but very limited class. In a table of prices of the product of ninety-six manufacturers recently published in one of the French automobile papers, only one car is quoted at

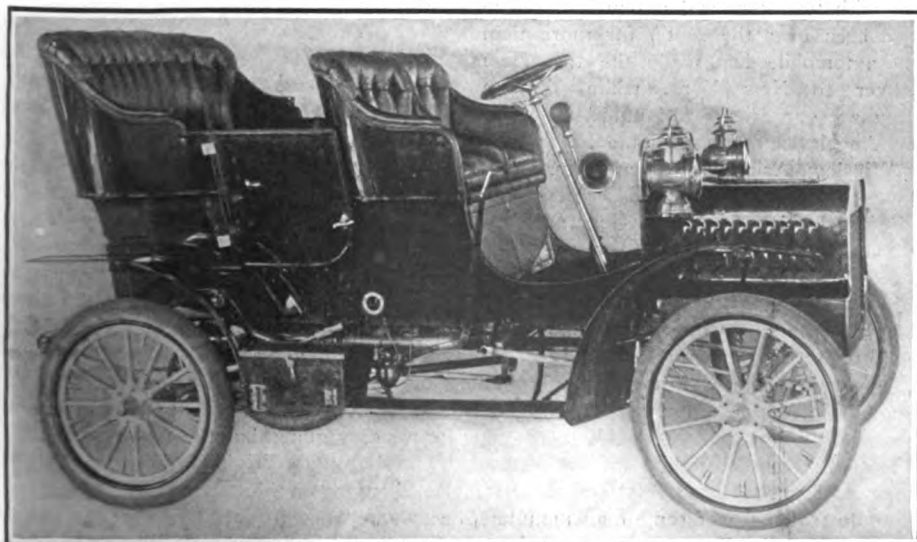
a price below \$600—for the chassis alone. The list included seventy-five makes of French cars.

"I would suggest," writes Consul Goldschmidt, "that a certain number of American manufacturers club together and establish agencies in various parts of the country. Such agencies should have show rooms or garages for a number of American machines; should be provided with serious and hard-working managers; should have workshops where the necessary repairs could be well and quickly made, and should have constantly on hand a full supply of the different parts of the machines so that broken or damaged parts could be immediately replaced.

"In speaking with a local dealer in automobiles, I was told that one of the principal obstacles to the importation of American automobiles was the impossibility for quick repairs, due to the distance from which duplicate parts would have to be sent, and the consequent dissatisfaction of the owner of the machine. As the class of customers to be reached would not represent the wealthiest, a certain credit system might be established, and machines might be sold to many reliable people who cannot always afford to pay cash for a machine. This class includes the smaller business men, professional men, such as doctors, and many others, who would buy them for pleasure vehicles. Such machines could also be sold as auxiliaries to the wealthier owners of expensive machines, for small trips or for local use."

The use of tar as a dust preventive has not proved an unmixed blessing in England, a stretch of road so treated near Walton-on-Thames having developed marked qualities toward increasing the tendency to side slip, it is reported. The tar-treated surface, while highly satisfactory in the summer season, seems to be a failure in wet weather.

Tires should be overhauled in the spring and put in the best possible condition to start the season. A word to the wise is sufficient.



MOLINE MODEL G FOUR-PASSENGER TOURING CAR FOR 1906, WITH DOUBLE-OPPOSED ENGINE.

Growing Importance of Tax-Free Alcohol.

WASHINGTON, D. C., March 19.—A clear and concise statement about the measures now pending in Congress which seek to remove the internal revenue tax from grain alcohol to be used for industrial purposes was made in the House of Representatives recently by Representative Marshall, of North Dakota, who has made an exhaustive study of the subject. He took up in turn every phase of the question and showed conclusively that the proposal has "tremendous possibilities for the good of the whole people of the United States."

The proposition, he claimed, is to permit the removal from bond, without tax, of denatured alcohol. The tax imposed is from 1,200 to 2,000 per cent. of its cost to manufacture, which effectually and completely prevents its use for power purposes. By permitting the use of this tax-free alcohol, he said, we will put our manufacturers and consumers on an equal footing with those of other nations.

Aside from the general good that will come to all the people in a comprehensive way, there are two interests that will be directly and materially benefited by the removal of this tax. First, there are the numerous manufacturing industries and those dependent upon and identified with them; second, the agricultural classes and those closely allied with them, and particularly the residents of the small towns and cities in the agricultural states.

Referring to the use of alcohol in engines, Representative Marshall said: "This brings us to the internal-combustion engine. Few realize the size of the gasoline or internal-combustion engine industry. Mr. Capon, representing the Detroit Board of Commerce, made the following remarkable statement during the recent hearings before the Ways and Means Committee: 'Detroit alone will produce in 1906 enough gas engines for automobile, marine, pumping and other uses to consume 200,000 gallons of fuel a day.'

"Is it any wonder that gasoline has practically doubled in price in a few years? And, in view of the fact that only 2 per cent. of gasoline can be made from petroleum, we are soon to face a famine in fuel for such engines unless relief is afforded. It is well known that the largest percentage of automobiles are driven by gas engines. And agricultural implement manufacturers are preparing to turn these engines out by the thousands adapted for farmers' use. The time is near at hand when every farmer will have one to pump water, haul his feed, run his cream separator, hoist his grain, and, ultimately, to do much of the trucking and drudgery of the farm and transport himself and family.

"As I speak a new type of car is moving across this continent driven by electricity, generated as it travels by gasoline engines, or, at times, by both the surplus electricity

from a storage battery (charged by the engines under way) and by the engines. Great things are expected from the experiment. And it is entirely within the possibilities that there will be opened up a hitherto unthought-of field for the use of fuel alcohol. In a general way it is conceded that alcohol will displace the use of gasoline in internal-combustion engines. Some difficulties there are which will have to be overcome, one of which is the fact that alcohol volatilizes more slowly than gasoline, thereby making the engine harder to start. Possibly other difficulties will have to be overcome, but overcome they will be as soon as the material is at hand."

This is the first of a number of able speeches that are to be made in Congress on this important subject, and the feeling is general that a bill will be enacted removing the tax before the present Congress adjourns.

CONDUCTED AUTO TOURS.

Personally conducted European automobile tours are the very latest and attractive method of spending the summer abroad. The idea originated with T. Winton Henderson, of Philadelphia, who has planned three tours for the coming season, each to

last about six weeks, the cost for which, including every expense—steamship, hotels, railroad fares when necessary, and even amusements, is less than \$1,000. The first party will leave New York May 23, via steamship *Noordam*, the second party on the *New Amsterdam* on July 4, and the third party sails on the *Zeeland* on August 11.

Paris will be the starting point, and the first and third parties will journey via motor car through France, Spain, along the Riviera, returning by way eastern France to Paris. The second party will tour Switzerland. American machines will be used exclusively, and only four passengers will be allowed to a car, each passenger being allowed one piece of light baggage. Trunks and heavy baggage will be shipped ahead. Mr. Henderson will drive one car on every trip and look after all arrangements.

Successful trials of an automobile omnibus have been made by the Catalana Omnibus Company, of Barcelona, Spain, and it is reported that the company now hopes to replace its horse-drawn stages entirely with power vehicles. As soon as its charter has been revised the motor buses of the company will probably run from Barcelona to Garcia, Sans, San Gervasio and San Andrés.

"Mountaineer" to Have Company to Denver.

LAS VEGAS, N. M., March 14.—The original course of the transcontinental return trip has been changed, and instead of following the Santa Fe railroad through Trinidad to La Junta and into Kansas, the new course will take the *Mountaineer* north from Trinidad, through Pueblo and Colorado Springs to Denver, then east, following the line of the Union Pacific railroad to Kansas City.

This change was decided upon only after a careful examination of maps and further talk with teamsters and automobilists who have been over the route, for more than one automobile has made the trip from Denver to New York, while William Vaughan, our friend and guide, who left Los Angeles and ran with the Reo as far as Winslow, Ariz., has driven a small machine from Buffalo to Las Vegas.

Before leaving Santa Fe, Governor Hagerman, the youngest state or territorial governor in the country, accepted our invitation to share the front seat, and plainly showed his fondness for automobilism while the little touring car tore across the level prairie in the vicinity of the capital over the rough New Mexican country, for he really seemed to enjoy it.

The run from Santa Fe to Las Vegas, while over smooth roads most of the way, certainly took us over some high mountain peaks. Once we got lost, and an hour was spent trying to find ourselves. It was

the same old story; we started out, following a trail that looked good, but it gradually diminished without any apparent reason until finally all signs of a trail were lost, and there was nothing to do but follow our own wheelmarks back to where we took up the blind trail.

From Santa Fe to Las Vegas, I shared the front seat of the Reo with John Catron, son of ex-Congressman Catron, of Santa Fe, while Charles, another son, acted as escort with his little Stanley steamer, in which he carried two besides himself, Fassett and another enthusiast.

At Las Vegas we found three enthusiastic automobilists, owners of a Reo, a Cadillac and a Ford. Dr. Smith, surgeon for the local troop of cavalry, allowed us to quarter our automobile in the armory, where he kept his own. Catron's steamer was also housed in the same building, as he is going as far as Denver with the *Mountaineer*.

Snow covered the ground again this morning, and the dark clouds in the direction of the Raton mountains tell very plainly that we will have some little trouble in getting over the pass. From all accounts the roads from Las Vegas to Raton should prove easy going, but the twenty-odd miles from Raton to Trinidad, Col., are said to be about the hardest running we have yet encountered, with apologies of course to Canyon Diablo, Arizona.

PERCY F. MEGARGEL.

TENDENCIES IN CAR DETAILS AT SALON.—V.

By RENE M. PETARD.

(Concluded from page 479, issue of March 8)

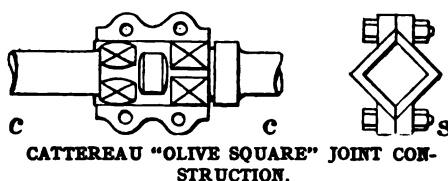
PARIS, March 8.—From the clutch to the change-speed gear-box the rule is now to allow a much greater distance than had been the custom up to the present. Among the reasons for this increase in length of the clutchshaft we find that the main ones are: First, the desire on the part of the designers to make the different elements of the car, such as the engine, clutch, and gear-box, individual and independent elements, as much as possible. The object of this being to make each of these parts easy to dismantle, repair, or keep in condition without having to disturb in any way the other parts. This policy as regards the clutch and gear-box naturally requires a separate shaft for each of these, with a special coupling to transmit the drive. This coupling is in many cases made in the form of a flexible joint of some kind, the construction presenting the further advantage of avoiding for the bearings and shafts in the system a great many bending or similar strains (caused by torsions of the frame under severe shocks), which would prove detrimental to their life and ease of working.

In other machines, made by what we might term a different school of designers, whose aim is perfect rigidity, we find that no flexible couplings are used between the clutch and gear-box, but simply rigid flange couplings as usually used in power transmission shaft lines. In cars where this policy is followed, a subframe is generally found, which forms with the frame proper a stiff beam construction, further strengthened as a rule by large gusset plates. In some cases the flexible coupling mentioned takes the form of a full universal joint or even of a short regular double-jointed shaft. In other cases the joint simply consists of one or two "olive squares" clamped in a split sleeve, square bored. In all cases provision is made to allow a backward motion of the clutchshaft when the joint is dismembered, so as to allow the easy withdrawal of the clutch proper from the flywheel; a little end play always exists when in working order so that the end thrust from the clutch parts is not transmitted to any part not intended to bear it.

In the Cottureau cars the olive square joint construction is typically exemplified. In Fig. 1 the clutch shaft *c* is forged at its rear end to form a ground, casehardened, and tempered olive square, while the end of the gear-box primary shaft is similarly treated to form an ordinary straight-edged square, which is rigidly and securely clamped by the drop-forged sleeve *s* shown in end view separately. The clutchshaft

thus transmits its drive through the sleeve, the proper distance being maintained between the two shafts by a round-ended small steel cylinder, as shown. The length of this small cylinder is such that when it is removed with the sleeve the clutchshaft can be pulled back sufficiently to clear the clutch cone from the flywheel, as before mentioned.

Passing to the gear-box proper, we find that in the best models free use is now made of the special gear steels supplied by one of the best makers in the center of France. This steel contains a high percentage of manganese and silicon, and besides its remarkable tensile strength and elastic limit, shows great strength under



the dropping weight tests and extreme hardness without casehardening. The gears cut from this material need only be much lighter and narrower than those cut of even the best carbon steel, and its increasing use caused a tendency toward the production of smaller gear-boxes than ever before, with additional strength.

In the forming of the gears different policies are followed. In the cars where cost is rather a matter of little importance and where the manufacturing facilities are very great, the system used to the greatest extent, up to the present, has been to cut the gears solid with their shafts, or with the sleeve which carries them in the case of a sliding set, this policy being adhered to whatever the size of the gears might be. This construction evidently makes a most reliable system when the proportions of the parts are right from the start, and permits very accurate work when steels requiring no intense heat treatment are used, but its drawbacks, besides that of high cost, are the high cost of a spare part should the least accident happen to either the gears or their carrying member, and the tendency to warp if casehardening is necessary for the steel used. A less costly and now preferred method is to cut the gears separate and to bolt or rivet them on flanges formed on the shaft. This construction has the advantage of permitting a very easy replacement of a damaged part, of permitting the use of different material for the shafts and the gears, which is good practice, and also to insure a greater average of accu-

racy. Its drawback is lesser reliability as regards the possibility of a bolt working loose or shearing, although this should be very rare, and also slightly greater weight.

The consequence of these advantages and disadvantages of both systems have induced several makers to look for a different solution. Darracq forms his gears as light as consistent with strength, and leaves them a strong, round-bored hub. The two ends of the hub are formed with castellations or jaw clutches, which (when all the gears are slipped under pressure on the round shaft) interlock with each other, thus forming a solid mass as far as the drive is concerned, permitting at the same time the removal or replacement of any gear that may make it necessary. In this case the shaft is only called upon to center the whole and not to transmit the drive in any way. Dupressoir, Richard, and a few others use a somewhat similar construction. In their change-speed gears the gears are formed with a square-bored hub and are all successively forced upon a square shaft, fitting the latter, no longitudinal play being allowed once the whole is assembled. In this case the shaft alone takes the driving effort.

Passing to general disposition of the parts in the mechanisms shown, we find that, as was the case last year, the one, two, and three sliding sets systems are still all enjoying the makers' favor, while the latter distinctly takes the lead as regards the highest grade cars.

The single sliding set system is still used, however, by firms of repute, such as Brasier and Richard. Its advantages from a manufacturer's point of view residing in lower cost and simpler actuating mechanism, while its drawbacks are the necessity it involves of using longer and consequently less rigid shafts, and also the greater difficulty for an inexperienced driver in properly changing gears.

Multiple sliding sets gears are more in favor this year, as they permit the design of lighter and more compact gear-boxes; at the same time they further permit the use of a better supported shaft, as by their employment it is possible to use a middle bearing besides the end ones on the gear-box shafts.

Double sliding set systems are the least used, the most usual being either one or three. On the C. G. V. cars one of the set gives the reverse and the two lower speeds, while the other gives the two higher ones. This is the only noteworthy example of this construction among makers of world-wide repute. Mercedes, Hotchkiss, Itala,

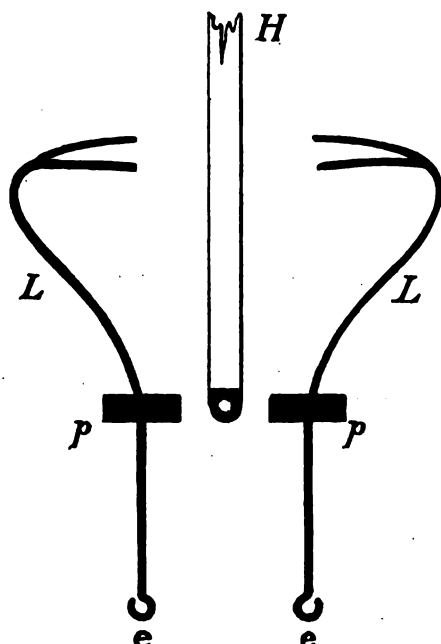
and others use the three sets type. It is to be noted that last year Hotchkiss used only two sets. The actuating system generally used for the manipulation of the gears in case of multiple sets systems is generally of the Mercedes selective gate type. This is too well known to require a description here; it may, however, not be useless to mention here that Maybach, of the Cannstadt factory, who owns the master patent on this system, has announced his intention to bring suit against users of this system on cars other than Mercedes. That the patent is a good one has been ascertained, and there is no doubt, as far as Europe is concerned, at least, that should Maybach persist in his intention there will be trouble brewing for a number of makers.

In consequence it will be of interest to describe the means by which the Delahaye people made a selective gear without infringing the Maybach patent. The accompanying rough sketch, Fig. 2, will make this clear. Two short levers *L* are fulcrumed on pins *P* and are always connected by their lower end *e* to the gear-actuating rods. Their upper end carries a notch or fork just at the level of the sector. Between these two levers is placed the actuating hand lever proper, *H*, which reaches to the driver side. Besides allowing the usual motion in the length of the car, the articulation on which this lever works also allows it a slight rocking motion sideways, so that it can be brought to engage with either of the two short levers and then to actuate them in the desired manner.

Change-speed gears different from the now generally adopted lines were not numerous at the Salon. A typical one, giving all speeds direct with only one pair of gears in mesh at any time, has already been described while studying the Lizaire & Naudin small car under a different heading. A construction to the same end can also be found on the Pilain car, which (taking up again an old idea and perfecting it) uses no spur gears in the gear-box for the forward speeds but simply has three sets of bevels, the pinions of which are all fast on the driving shaft and mesh with bevel wheels loose on the back axle shafts. If any of these wheels is made fast by suitable means with the axle, the driving effort will be transmitted without other intermediary to the latter, thus giving a direct drive on all three speeds, which are obtained by the differences in the number of teeth of the different bevel sets. In the Mors gear-box for the past two years and now also in the Mercedes, two bevel sets are used, one at the end of each of the gear-box shafts, thus when on the high gear that at the end of the primary shaft gives direct drive, while on the lower gears the set on the secondary shaft gives the drive from the latter, without returning it (as is usual) to the primary shafts. This avoids the use of one set of spur gears which in ordinary circumstances are otherwise always in mesh and actually working on all but the high gear.

This system has been considered by the Mors people as their property, since they patented it when they first put it on the market, and in consequence they have decided to take proceedings against the Mercedes people for its use. This patent affair, together with that already mentioned on the gate change system and the well advertised one on direct-drive gears by the Renault house, seem to form a pretty happy state of conditions for the patent experts just at present.

Before leaving the change-speed gearing subject it might be said that a new tendency is shown by some concerns, among which De Dietrich and Fiat, who, considering the high speed which powerful cars now give on the top gear, found by experience that the next lower gear was used at least as much as the higher, and that considering the extra loss of power on such a gear



DIAGRAMMATIC SKETCH OF DELAHAYE SELECTIVE-GEAR CHANGE-SPEED LEVER.

with the usual direct drive arrangement, it would be preferable to return to the old no-direct-drive type, which they have done. A similar move has been followed in England by the Rolls Royce people, who fit their cars with direct drive on the third gear, the fourth being indirect.

The subject of live axles, which in sequence should form the next and last step in this general review of the tendencies in car design, has already been treated in a previous issue under this same heading, when considering the carriage part of the automobile.

Between the gear-box and the axle we find the chain or the cardan. These two names thus put together sound very much like war. Which will eventually win? No one knows; and the question is perhaps more debatable now than ever before. The commercial point of view often prefers the cardan, the technical point of view never knows which to prefer. The chain tri-

umphs at the G. B. race and its eliminatory trials, it triumphs at the French Ardennes, and at the Jaunus. The cardan triumphs at the Belgian Ardennes, in Italy at the Brescia, in America in the Vanderbilt race.

In the chain-drive cars the sprocket bolted to the wheel spoke by projecting studs is no longer used. The rule now is to place it on the inner edge of a drum tightened on the spokes by bolts. The countershaft is almost always fitted with universal joints between the differential and the sprocket, or else is mounted in a casing entirely or partly enclosed, so that absolute rigidity can be obtained without in any way affecting the shaft, even under the severest shocks. Cardan shafts are made with one or two joints, apparently indifferently, as just as many makers use one as there are others who use two, and the working is just as satisfactory in one case as the other. Elastic couplings are gradually disappearing, after having been used to a considerable extent, this probably because the improvements in clutch construction have made them unnecessary.

British Industry Statistics.

At a big gathering of pressmen in London one Saturday recently, on the occasion of a dinner given by S. F. Edge, of Napier fame, some interesting statements were made concerning the progress and present state of the British motor industry. From statistics compiled by Mr. Edge it appears that during January the value of British motor cars manufactured totaled to £468,000, not counting the production of some of the smaller firms. In the same month the imports of foreign cars reached £317,000, not two-thirds of the British total. If consideration be made of the big percentage of the total French production which is imported into England, and which is grouped together with American, German and Italian cars in this £317,000, it will be gathered that at last the British motor car industry has attained proportions which are at least as large, if not larger, than that of France. The total value of manufactured British cars during the year will in all probability total up to between £6,500,000 and £7,000,000.

Other interesting facts evolved at the dinner were that thirty-four manufacturers employ the six-cylinder principle, made commercial by the Napier firm in 1903, and also that with Napier cars in future will accompany a three years' guarantee.

Dust experiments on a very scientific scale are being planned over a mile and a half of the London to Maidstone route in England, which will be divided into three sections, one to be laid with the small sets so popular in certain parts of Germany, one with tarred slag macadam, and the third with "quarrite." The results will be made a basis for further work in this direction.



UP-TO-DATE STAGE LINE IN THE NEVADA DESERT.

Across the Nevada Desert.

The stage line operated in the Nevada desert, from Goldfield to the Bullfrog district, a distance of eighty miles, is in prosperous operation. The accompanying photograph was taken February 24, at what is known as Farmer's Station, midway between the terminal points. The trip at this time of the year is very delightful. Although the temperature has risen to about 100 degrees, it is not felt so severely because of the altitude. The automobile road, which is not the same as taken by the regular stage line, is in excellent condition, as a large amount of money has been expended in places. For its greater length it is smooth and hard as asphalt.

The automobile line is used exclusively by the wealthy mine owners in going back and forth. When Charles M. Schwab visited the district recently, he went about in an auto. The trip is made in a little over four hours, or at a speed nearly equivalent to twenty miles an hour. The line has proven a good money maker, as \$25 is charged each person for the trip. The machines used are Pope-Toledos.

Important French Ruling.

The Supreme Court of France has rendered a decision that automobile, motorcycle and bicycle drivers or riders are not compelled to turn to the right side of the street at a crossing or on public square. The court holds that, owing to the heavy traffic at such places, prudence and advisability should decide the driver or rider as to whether he should turn to the right or to the left or take the middle. The police regulations provide that drivers must invariably turn to the right.—*Exchange*.

A 13-Year-Old Automobilist.

CRAWFORDSVILLE, IND., March 19.—That boys are born with the automobile instinct nowadays seems to be shown in the case of Fred E. Albright, of this city. Young Albright is but thirteen years old, and is the son of an automobile agent and proprietor of the local garage. The boy seems to

know almost as much about a machine as his parent. He has been known to talk to a prospective buyer after the manner of a man who has built an automobile, correctly calling off technical terms employed in such a description. He is able to show the parts of the machines handled by his father and to describe their workings, from the



FRED E. ALBRIGHT DRIVING HIS MAXWELL.

sparker to the steering gear and transmission.

He is accustomed to drive a Maxwell runabout long trips, and when he goes out he is depended upon to come back without having to send for anyone to fix him up if

anything goes wrong. The boy took to the business naturally, without much training from his father. It is claimed that he has sold a machine or two on his own demonstration of good qualities.

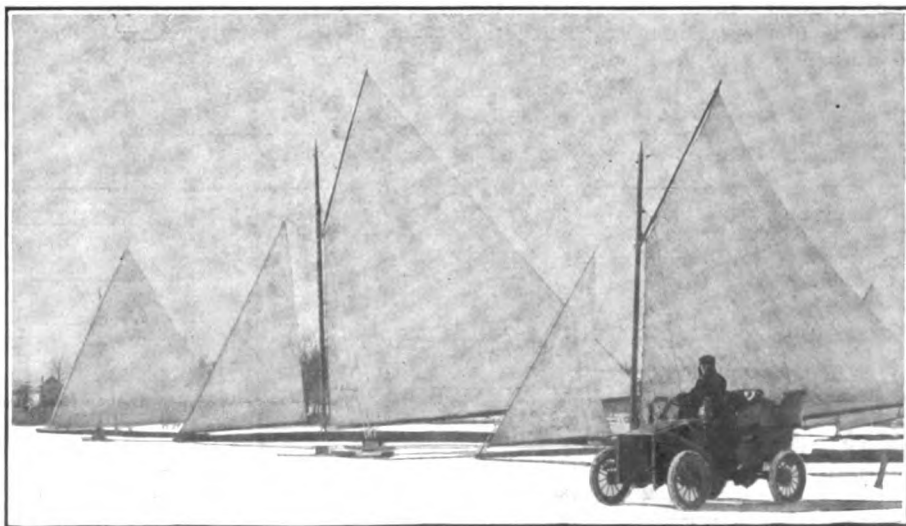
Attitude of a Jersey Township.

PATERSON, N. J., March 19.—Ramsey's Grange, No. 135, has placed itself squarely on record as opposed to the proposition of the Hohokus (Bergen county) township committee to macadamize Franklin turnpike to the state line. Though automobilists have offered to contribute to the macadamizing of this road, and this money with what would come from the state, would leave only a trifle for the township to pay, the Grange views the automobile as something that should be suppressed. After resolving in a prejudiced manner, and dragging in the exaggerated reports of the Vanderbilt incident in Italy, the Ramseyites placed themselves thus on record:

"That we condemn the spending of one of the hard-earned dollars of our citizens for the building of said road, and that we regard any township committeeman voting for the same an enemy to the common good."

Mounted Police for Toledo.

TOLEDO, O., March 19.—The Toledo board of public safety seems determined to eliminate speeding on the streets of Toledo. At least the attempt is to be made, and with this in view preliminary arrangements have been made to provide mounted police, an innovation in Toledo. Action to this effect is brought about, so state members of the board, through several accidents which have occurred in the immediate past. Several schemes have been tried to eliminate speeding on the prominent streets, but all have failed and mounted policemen are now to be resorted to as a final means.



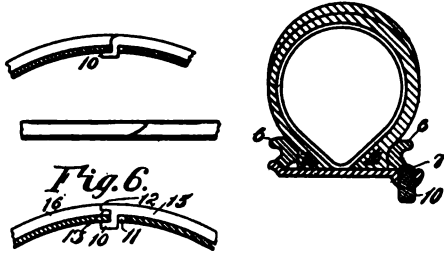
WHITE AUTO DEFEATING ICE BOATS IN CONTEST ON GULL LAKE, NEAR KALAMAZOO, MICH.

Patents

Detachable Tire and Rim.

No. 814,088.—F. A. Seiberling, of Akron, O.

A detachable tire with "universal rim" of the form shown in the section. The flange 6 is held on by a split ring 7, which encircles the rim and fits into a groove



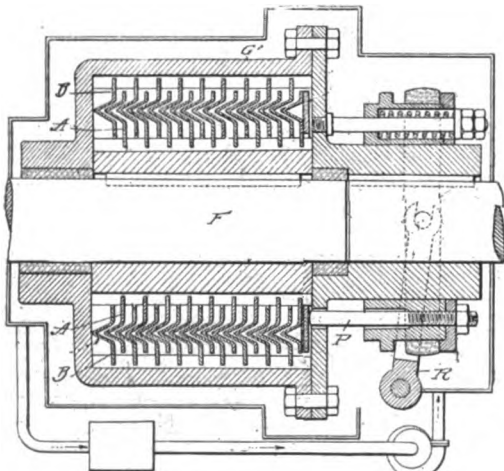
SEIBERLING TIRE AND RIM.

rolled into the latter. The ends of 7 are scarfed to lap where they come together, and one of them has a lug 10 which fits into a slot in the groove. See the details showing the formation of the ends.

Clutch Mechanism.

No. 814,132.—H. S. Hele-Shaw, of Liverpool, Eng.

The Hele-Shaw friction clutch used in some English automobiles. It is a multiple disk clutch with the disks of the special corrugated form shown in the right-hand detail. The disks *A B* are alternately connected by loose keys or otherwise, with the driving and driven members *F* and *G*. They run in a tight case in a bath of oil, whose access to the friction surfaces is facilitated by the hole *c*. Means are provided where necessary to insure circulation of the oil, and the disks are separated on release by the springs *d d*, which act between alternate disks. In the arrangement shown, the clutch is engaged by the action of a suitable number of springs which tend by expansion to force pins *P* to the left or inward, and to carry the casing *G* to the right, thus pressing the disks together. Release is by lever *R*.



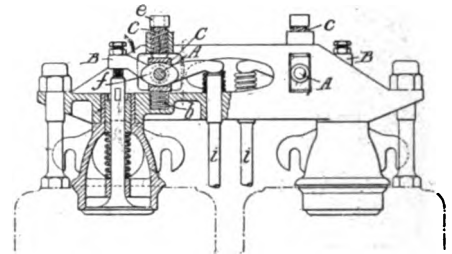
HELE-SHAW CORRUGATED MULTIPLE DISK CLUTCH.

Inlet-Valve Mechanism.

No. 814,421.—H. Austin, of Birmingham, Eng.

A system of control by governing the lift and timing of the inlet valves. As the drawing shows, the valves open vertically downward and are actuated by push rods *i i* and rocker arms *B B* fulcrumed at *A A*. The timing and lift are varied by changing the position of the fulcrum, which is carried in a block *C*, suitably guided and movable up and down. A spring *b* holds *C* against the point of a steep-pitch screw *c*, whose partial rotation by the arm *e* and connection *m* raises or lowers it. The higher *C* and *A* are raised, the greater is the lost motion between *B* and the valve.

partly shown, with the usual propeller shaft. At the center of 7 are the cross pins 15 16 carrying the small driving pinions 9 10 of the differential, which mesh with the bevel gears 11 12 connected re-

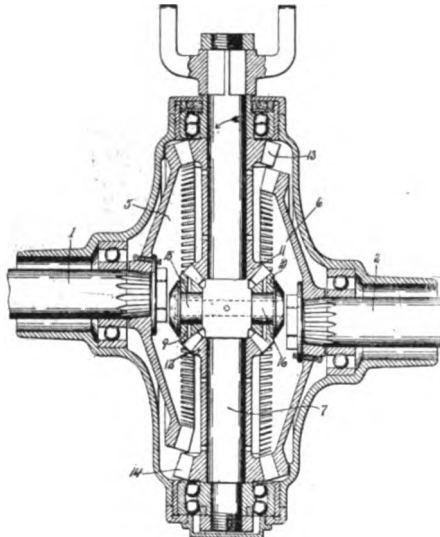


AUSTIN INLET-VALVE MECHANISM.

Live Axle Design.

No. 814,268.—A. T. Brown, of Syracuse, N. Y.

A novel departure from the accepted types of differential and bevel gear drive.



BROWN DIFFERENTIAL GEARING.

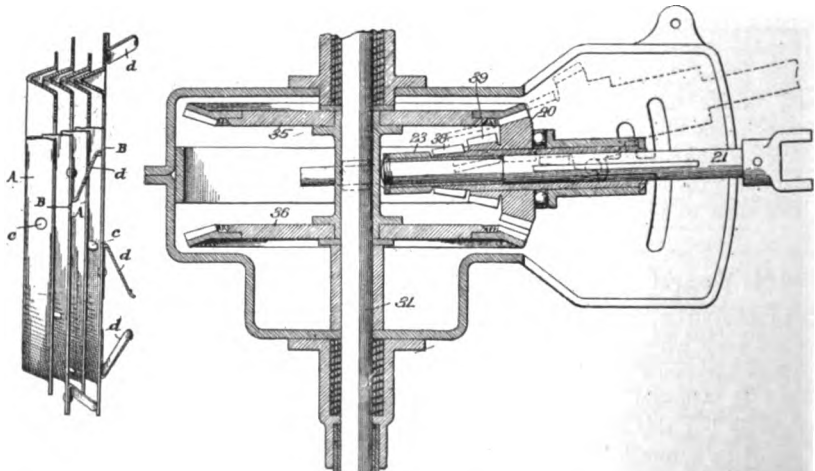
The live axle shafts 1 2 are offset in the horizontal plane and the bevel gears, 5 6, which they carry, engage separate pinions 13 14, sleeved loosely on the pinion shaft 7, which connects through a cardan joint,

spectively with 13 and 14. The effect is to run the differential at the speed of the propeller shaft, permitting it to be made very small and light; and it also permits the rear axle to be cambered, allowing the use of dished rear wheels.

Change-Speed Gearing.

No. 813,770.—E. M. Burr, of Champaign, Ill.

The speed is changed by causing one or another bevel pinion, 38, 39, 40, to engage the bevel gears 35 or 36, one giving the forward and the other the reverse motion. The bevel pinion set is splined on a shaft 21, whose axis intersects the axis of shaft 31, and whose rear bearing 23 is pivoted (through means not shown) to swing laterally about the axis intersection as a center. The pitch cones of all the bevel pinions have their apexes at the same point of intersection when the pinions are meshed with the bevel gears. A swinging carrier provides for the lateral shifting and holding of shaft 21, and power is transmitted to it through a shaft with universal joints. The operating mechanism for swinging the shaft and for shifting and holding the shaft is not shown.



BURR BEVEL-GEAR CHANGE-SPEED MECHANISM.

Canada's Automobile Show Circuit.

Interest in automobile exhibitions has shifted across the border, our Canadian cousins having caught the fever. The storm center hovers over Toronto, where two exhibits will be held, the first under the auspices of the local dealers' association, March 31 to April 7, and the second under the management of R. M. Jaffray, Jr., at the Mutual Rink, April 9 to 14. The dealers' association exhibit will be limited to the lines carried by its members, but the Mutual Rink show is open to all makes, and eleven makes of foreign cars have engaged space, viz.: Panhard, Argyle, Swift, Napier, Daimler, Rex, Triumph, Zenith, DeDion, Star and Humber.

The Montreal show is also under Mr. Jaffray's management, who has announced its dates, April 21 to 28, the Arena being the building selected for the purpose. The foreign makers mentioned above will also exhibit at Montreal. J. C. Palmer, of Toronto, who is interested with Mr. Jaffray in the conduct of the shows, is now in Europe interesting the manufacturers. That his efforts have been eminently successful is self-evident, the big line of English and French cars now en route for the shows attesting the fact.

That the Canadian shows will stimulate the efforts of American manufacturers to secure a foothold in the Canadian market goes without saying. This market has never been very actively canvassed; in fact, it can be truthfully said to have been very seriously neglected, the neglect, no doubt, having been largely due to the inability of our factories to more than supply American demands. There is a great future for our automobiles in the Dominion, and the coming exhibitions will serve a good purpose and have far-reaching results.

Dai H. Lewis, of Buffalo, manager of the recent show held in that city, is assisting Manager Jaffray in his preparations, and was in New York this week in the interest of both Canadian shows. He is optimistic over the prospects, and stated to a representative of *THE AUTOMOBILE* that the great success of the American shows would be duplicated; that every place he had visited in Canada was alive with interest in automobiles and that a great future was in store for the industry there.

SHOWS TO COME.

Denver's automobile show, which has been sanctioned by the makers' association, will be held in that city in the Coliseum Hall, April 18 to 21, inclusive, under the management of G. A. Wahlgreen. A number of the Western makers have applied for space, and a good representation of Western products is expected, as well as those of the prominent Eastern makers. The decorations of the hall, it is announced, will be of notable character, and a large attendance of local dealers from

all parts of Colorado and adjoining states is expected.

The Omaha Auditorium will be the site of the first automobile show held in that city, and April 4 to 7, inclusive, the dates. The Omaha Dealers' Association has joined issues with the Auditorium company, and it is stated that the exhibit will be the largest so far held west of Chicago.

[CONSIDERING THE OPEN-AIR SHOW.

Empire City track will be the scene of a three days' open-air automobile show on May 24, 25 and 26, if the present plans of the New York Automobile Trade Association materialize.

President Mabley, of the association, has appointed a committee of arrangements,

Philadelphia on the Show Question.

PHILADELPHIA, March 19.—Coming as it did, right on the heels of the most successful show ever held here, the recent dictum of the National Association of Automobile Manufacturers prohibiting future local exhibitions, and providing punishment for disobedience of its ukase, caused considerable comment among local tradesmen.

One of the latter, in commenting upon the prohibition, said to *THE AUTOMOBILE* correspondent: "Why should the makers make such a ruling general? Why not confine sanctions to such cities as, from previous experience, can assure profitable returns? That any manufacturer of automobiles lost money, or will lose money, as a result of the show held in the Export Exposition Building here I cannot believe. Granting that there be one or more who so suffered loss, there are a dozen winners for each loser. Nor can I believe that the national trade body will persist in its action when the remarkable boom which follows our show is brought to its attention. I am

converted to the belief that such exhibitions in the early spring are advantageous—nay, necessary—in Philadelphia."

consisting of Frank Eveland, Percy Owen, C. Andrade and W. A. Haradon, to inquire into the practicability of such an exhibit, and it is expected definite action will be taken at the next meeting of the Board of Governors, when the committee will make its report.

The plans under consideration include an exhibit of cars under large tents and the utilization of the track for tests and a short program of racing each day.

A. D. Bolton, a rural mail-carrier whose route is near Abilene, Kans., bought an Oldsmobile last fall for use in his work, and after a trial extending through the winter he is convinced that the runabout has a great advantage over horses. Formerly it took him all day to make his route, but now he covers it in three hours, leaving his afternoons free.

Similar opinions were voiced by other agents. The managers of branch houses, while admitting that they benefited by the recent show, seemed inclined to "stand pat," saying the makers evidently knew what they were doing. The opinion seemed to be general, however, that no manufacturer would interfere with an agent who desired to show at his own expense. It was also the general opinion that a show could be held in Philadelphia next year, even though it be a purely local affair, with no outside assistance from the manufacturers of automobiles.

The matter will be discussed in all its bearings at the next meeting of the Philadelphia Automobile Trade Association. Members of that organization, who will get a rebate on their show expenses, are especially interested in a continuation of the local shows.

Indianapolis' Hopes Are Shattered.

INDIANAPOLIS, IND., March 19.—An unexpected blow was dealt the open-air show and race meet proposed to be held here next fall, when it was discovered that the Indiana State Fair Grounds were not large enough to permit a two-mile track to be built.

Headed by Carl Fisher, a local dealer, Indianapolis capitalists and manufacturers have been making a strenuous campaign to secure the show. Permission was asked of the State Board of Agriculture to build a two-mile track inside the fair grounds and surveyors were put to work surveying the proposed track. Saturday it was discovered that the grounds were only large

enough to allow of a 1 3-4-mile circuit being constructed.

Hope of securing the show has not been abandoned, however, and efforts will be made to obtain enough adjoining land to build a track of the size desired.

Mr. Fisher and several others have planned to incorporate a company to hold out-door shows and race meets in Indianapolis. In connection with the show it is planned to have a week of racing, with a programme that would attract some of the best cars in the country. Three 100-mile, two 500-mile and one 1,000-mile races have been planned, with a purse of several thousand dollars for the longest event.



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Start the 1906 A. A. Tour in the West. The growth of automobiling in the Middle West is substantial and assured. That the Westerners are entitled to consideration in the route of the 1906 A. A. tour for the Glidden trophy is a proposition that does not admit of any argument in the West, and the East should be fair enough to recognize this fact.

True it is that the average roads of the West, during the rainy season, and even in the months when rain is scarce, are far from ideal for perfect touring conditions. But for several years past every tour of any importance has started in the East, and last year the route was practically confined to New England territory. For a tour one cannot dispute the superiority of the excellent highways of Connecticut, Rhode Island, Massachusetts and New Hampshire, but the American Automobile Association, being a national organization, must take into consideration that it owes something to its members in other parts of the country. Furthermore, it would be a courteous thing this time for the Easterners to journey to a Western city and escort their fellow automobilists to the good roads in the Eastern section.

If the Touring Committee decides to make Cleveland the starting point, that convenient city would be easy of access from such large automobile centers as Chicago, Detroit, Toledo, and Buffalo by boat, while Cincinnati, Pittsburg, Columbus, and other Middle Western cities would not find it a difficult matter to reach the starting point.

The exact destination of the tour is an immaterial matter, except that a picturesque country should be selected for the wind-up, taking into account the ever-present problem of proper hotel accommodations. Saratoga has been suggested as a terminating point, but it would not increase the mileage except in a pleasant way if the New England advocates were satisfied by another link that would carry the tourists into the White Mountains region.

To further suffice the New Englanders, a supplementary contest of another character might be arranged, starting from New York, calling at Boston, and joining the cavalcade from the West at some available place in New Hampshire, Vermont, or Massachusetts.

But let us give the Westerners a square deal in this touring program, even if it costs a little inconvenience to Easterners who are more used to model highways than corduroy roads. Perhaps a ride over bad roads will make Easterners appreciate more truly the worth of their good roads.



Trade Possibilities for Motor Builders.

Ever since the automobile assumed a practical form the energies of manufacturers have been devoted almost exclusively to the development of its parts, notably the motor, with a view to use in the automobile only. During the early stages of the industry changes were frequent and new designs kept the draughting force busy. Progress has been made, however, and in many cases manufacturers have evolved what may be called standard designs for motors, in which further improvements will consist of detail refinements, chief among which is the reduction of weight.

When this point is reached and the manufacturer finds the mental equipment of his establishment free to attack new problems, it seems logical that the adaptation of the motor to other than automobile work should be taken up. An essential step in this direction is the reduction of weight without sacrifice of strength. For the light high-powered motor, with details arranged for special work, there are many fields of usefulness which can be filled to the best advantage by no other prime mover now in use. Prominent examples are the motor boat, especially the fast cruiser; the flying machine, in which light weight is of prime importance; fire apparatus, which in its present form is greatly hampered by great weight; special military vehicles such as portable electric lighting plants; and self-propelled railroad coaches—a class of vehi-

cle which is apparently destined to fill the proverbial long-felt want.

The development of these and other lines is largely dependent upon the development of a light weight, high-powered motor; and the automobile manufacturer, by reason of his experience in building light motors, is in a better position to undertake the work than anyone else. The builder of stationary gas engines, for instance, is handicapped by lack of experience in cutting down weight, for in his work weight is not a mechanical disadvantage. The opportunity to enter new fields with a force already trained in light motor work is one that promises much and will doubtless be taken advantage of by American builders. The demand is here and is constantly increasing, and if the automobile engineer does not endeavor to meet it others in other lines of mechanical engineering will do the work. He is much better equipped to secure immediate results, using his automobile experience to avoid the errors that designers who have not had the ever-present question of weight to consider must inevitably fall into.



The Conduct of Automobile Competition.

Automobile racing is a complicated sporting problem unlike anything else in the realm of competition. Unavoidably it must be assisted and to some degree embarrassed by trade influence. One must be imbued with the desire to win or he becomes an indifferent contestant. In this winning all legitimate methods are to be employed, but in a combination which includes both man and machine unquestionably there are advantages to be gained through mechanical ideas that often verge into a field of doubtful procedure.

Automobile racing has no long-lived past with established precedents, its present requires careful consideration, and its future is an unknown quantity.

It would appear an unassailable standpoint that those who govern this complicated sport should neither risk warping through trade affiliations their judgment, nor should one who figures as a participant pass upon those acts which directly or indirectly relate to himself.

Criticism, as a matter of course, will be directed to Chairman Thompson and his associates on the Racing Board, but it is well to be free from any charge that influence has come from those who might have other interests that conflict with their official doings. The Racing Board of last year, thoroughly conscientious in its efforts, invited criticism of this character.

In the composition of the 1906 board, President John Farson kept this thought in sight in naming its members. The technical division of the board will not vote on any question, but will simply serve in an advisory capacity, thus returning to the original idea that rested in their selection. It will be a welcome relief to these men to serve solely in this manner.

The Grand Prix Preparations.

Entries Being Received, Racers Being Made Ready.—Darracq Will Have a Differential.—W. K. Vanderbilt, Jr., Orders a Six-cylinder Mercedes.

PARIS, March 12.—The fall of the Ministry has caused a delay in the granting of government permission to hold the race for the Grand Prix on June 26 and 27. This week a deputation from the Automobile Club waited on the Minister of the Interior to submit their scheme and ask for its authorization. The reply was deferred until a consultation could be made with the Minister of Public Works and the opinion of the Prefect of the Sarthe obtained. Before the day was out, however, the government had fallen, and with it the club's request, for it will now be necessary to await the formation of a new cabinet and pay an official visit to the successor of M. Dubief.

It had been intended to wait until all these formalities were accomplished before accepting entries, but owing to this sudden change engagements are being received at once, the fee being \$1,000 per car.

The \$20,000 subvention demanded of the Sarthe department by the Automobile Club of France is now practically secured, the town council having voted \$7,000; the Conseil Général, \$5,000; the railroad company, \$1,000, and the remainder being obtained by public subscription.

Active work on the circuit has not yet commenced, but the various teams are by no means idle. Hémerly ran down on one of last year's racers as soon as he returned home; Sis on a Renault, Wagner on a Darracq, and Duray on a Dietrich, have also made a close study of the circuit.

Cars Are Being Tried Out.

Despite the secrecy which is maintained regarding the French racers to take part in the Grand Prix, a few particulars have become known. Freak cars are entirely absent, and, indeed, in some cases, last year's models with modifications in detail only, will be seen at the starting line. Drive by side chain has lost ground this year, a larger proportion of racers having transmission by propeller shaft than before.

Two distinctive features will mark the Grand Prix racers: the center of gravity will be placed low and very large gasoline and oil supplies will be carried. Tanks with a capacity of over 40 gallons are being fitted on some of the racers in order that the six rounds of the circuit may be covered without a stop for refilling.

At the Brasier factory three four-cylinder racers are being built, with cylinders 165 mm. bore, and giving about 104 horsepower. They have four speeds, transmission by cardan to rear axle, are built low, and have the greatest weight placed well in the center.

The three Dietrichs will have chain drive;

the cars, which are well advanced, are of 130 horsepower.

Both Panhard & Levassor and Hotchkiss cars will have cardan transmission, the former racers showing an increase of horsepower on last year's models. The Hotchkiss engines have a bore of 180 mm., will be fitted with the new carbureter brought out this year, and will have high tension Eiseman magneto.

The Bayard-Clément, also with shaft drive, have four-cylinder motors of 180 mm. bore and 150 mm. stroke, running at a very high speed and developing rather more power than last year.

The Darracq racer will this year carry a differential.

Mercedes will be represented by three six-cylinder racers of 150 mm. bore and 140 mm. stroke, giving 135 horsepower, four speeds with direct drive on the high, ball bearings throughout, and capable of giving 110 miles an hour on the level.

W. K. Vanderbilt Orders a Mercedes.

W. K. Vanderbilt, Jr., while stopping in Paris this week, placed an order with the Mercedes concern for one of the six-cylinder racers, with which he intends to do some speeding in the states this summer.

Napier will also figure in the race with six-cylinder engines, the bore and stroke of which are 140 mm. Wolseley, who is also coming over, will bring 105-horsepower flyers.

What Cars They Drive.

The new A. A. A. officials are enthusiasts and all drive their own cars. President John Farson recently bought a new Acme; Chairman W. H. Hotchkiss, of the Highways Committee, drives a Packard; Chairman S. S. Gorham, of the Law Committee, is a Wintonite; and Chairman Paul Deming, of the Touring Committee, has been a White steamer man for many years.

1906 A. A. A. Racing Board

President John Farson, of the A. A. A., through Chairman Jefferson DeMont Thompson, Wednesday announced the make-up of the 1906 Racing Board as follows:

Jefferson DuMont Thompson, Automobile Club of America, chairman; William K. Vanderbilt, Jr.; H. L. Bowden, Bay State Automobile Association; R. Lincoln Lippitt, Rhode Island Automobile Club; E. Russell Thomas, Automobile Club of America; Frank G. Webb, Long Island Automobile Club; Samuel Walter Taylor, Automobile Club of America; A. G. Batchel-

der, New York Motor Club; S. M. Butler, Automobile Club of America; George L. Weiss, Cleveland Automobile Club; Ira M. Cobe, Chicago Automobile Club; Dr. W. H. Bergtold, Colorado Automobile Club; E. H. R. Green, Dallas Automobile Club; L. P. Lowe, Automobile Club of California; S. S. Gorham, Chicago Automobile Club, secretary.

Technical advisers: A. L. Riker, Bridgeport, Conn.; Peter Cooper Hewitt, New York City; E. R. Thomas, Buffalo, N. Y.; Henry Ford, Detroit, Mich.

Return of W. K. Vanderbilt, Jr.

W. K. Vanderbilt, Jr., donor of the Vanderbilt Cup, who recently had such an unpleasant touring experience in Italy, is due back in this country on April 3. A meeting of the Vanderbilt Cup Commission will probably follow his return.

Easter Meet at Atlantic City.

ATLANTIC CITY, N. J., March 19.—With an entry list already far exceeding, in point of numbers, that of the Florida meet of January last, the promoters of the three-day carnival to be held here April 25, 26 and 27 look forward to a symposium that will put the Southern speed test to the blush. Although the length of the beach precludes the running of any but mile events, the committee wisely concludes that from the spectator's viewpoint this will be considered a favorable factor; hence there's reason in the preparations being made to accommodate a crowd of 40,000 people.

No less than eighteen events are scheduled for the three days, made up of time trials, class championships, free-for-all and price handicaps, while special events, match races and a tug-of-war will be added to fill out the programme. Many of the prominent cars have been entered, including the Napier, Darracq, C. G. V., Fiat, Wayne, and White racers, while the prospects of securing the entries of the Ford, Mercedes, Panhard and Stanley cars are excellent.

A Private Speedway.

In order that he may enjoy the privilege of driving his automobile as fast as he desires without being haled into court, or danger to anyone but himself, Commodore Frederick G. Bourne, of the Automobile Club of America, is having a five-mile special course laid out on his Indian Neck estate at Oakdale, Long Island. The new track is over four rods in width and is double, the courses running parallel to each other with a divergence at the extreme ends to allow of easy turns. The northern limit of the course is at Bohemia and the southern end is adjacent to the Long Island Railroad track and one mile north of Mr. Bourne's mansion. Mr. Bourne, who already owns a number of fine cars, has sent an expert to Germany to purchase a high-powered racer with which to christen the new course.

What's Doing Among the Clubs.

CLEVELAND, O., March 17.—The Cleveland Automobile Club has announced a new series of mileage competition for this season. The conditions differ considerably from those of last year and are interesting. There will be no touring cup this year, as it was found there were some differences of opinion as to what constituted a tour. Instead there will be a cup for annual mileage and four quarterly cups for mileage. This gives those who may not secure new cars until late in the season, or who may be absent from the city for several months during the summer an opportunity to share in the competition for part of the year.

The mileage cup is to be awarded to any member of the club in good standing who owns the individual machine which makes the greatest mileage between April 1, 1906, and March 31, 1907, inclusive. The mileage must be recorded by an odometer of standard make that meets the approval of the committee on the points of reliability and accuracy: and must be read and recorded by the assistant secretary at the club rooms quarterly. This cup will not be awarded unless at least twenty-five members qualify as competitors by having their records read and recorded prior to or on March 31, 1907.

A quarterly mileage cup is to be awarded to any member of the club in good standing who owns the car which has made the greatest mileage in each quarter beginning April 1. Similar conditions as to recording instrument and quarterly readings pertain to the quarterly cup as to the annual mileage cup, and no cup shall be awarded unless at least fifteen members qualify as competitors.

THE PROSPEROUS A. C. OF MARYLAND

BALTIMORE, March 19.—The new quarters of the Automobile Club of Maryland, at Charles street and Mt. Royal avenue, were recently opened with a housewarming attended by sixty-odd members. It was an epoch in the history of the organization, for it confirms the new activity of the club, which a year or so ago existed almost in name only. Its meetings then were very few and far between, and the average attendance was eight or ten people. It allowed without any resistance the passage by the Legislature of a bill that is an abomination to all decent-minded motorists, and in other ways showed its lack of interest in automobile affairs.

Of late these things have changed, and to-day the Automobile Club of Maryland, while not wonderfully large in numbers, is one of the most active and most progressive little bodies in the country. Its membership is rapidly nearing the hundred mark, and its meetings always draw a good proportion of the members. W. S. Belding, its president, is a director of the Amer-

ican Automobile Association, and its membership includes representative Maryland citizens.

A buffet luncheon, generously diluted with champagne, was served during the evening, and later Osborne Yellott, counsel for the club, explained the present status of automobile legislation at Annapolis. He gave the impression that the automobile bill prepared by him, as published in THE AUTOMOBILE of March 1, was in no immediate danger, although he would not say that its passage was certain.

The Wachusett's Annual Dinner.

BOSTON, March 19.—The Wachusett Automobile Club of Fitchburg held its annual show week dinner at the Parker House last Friday evening. There were forty members present, including the presidents of almost all the automobile clubs of the state. President W. H. Chase occupied the position of honor and introduced the speakers, who were President Elliot C. Lee, of the Massachusetts; Lewis R. Speare, Bay State; S. L. Haynes, Springfield; J. P. Coughlin, Worcester; the Hon. H. E. Fletcher, of the Lowell Automobile Club, and Walter Perley Hall and Francis Hurtubis, Jr.

Re-elects Dr. Millbank.

ALBANY, March 17.—The annual meeting of the Albany Automobile Club was held March 17, when the following directors were elected for the coming year: Dr. W. E. Millbank, Joseph B. Taylor, O. A. Quale, C. M. Page and John Newell. The directors met immediately after election and chose the following officers: President, W. E. Millbank; vice-president, Joseph B. Taylor; secretary, C. M. Page; treasurer, O. A. Quale. The club was incorporated September, 1904, and has a membership of eighty. The work of constructing the proposed clubhouse will be begun in the near future.

Country Place of the Pittsburgs.

PITTSBURG, March 19.—Springdale, a pretty suburb up the Alleghany river, has been decided on as the site of the country clubhouse of the Automobile Club of Pittsburg. The club is having a road book prepared by Paul C. Wolff, secretary, that will give to its members a detailed map of the best motor roads in this part of the country.

A. C. A. Touring Bureau.

NEW YORK, March 19.—The Automobile Club of America has decided to immediately open a bureau of touring information for the use of its members. The Runs and Tours Committee of the club has engaged a special clerk to take charge of this department, which is expected to be one of great value. The entire time of the clerk in

charge will be devoted to perfection of the bureau, the functions of which will be the preparation and distribution of information concerning routes, hotels, repair stations, licenses, freight rates, registrations, speed laws, customs regulations and all up-to-date matters concerning touring, both in this and foreign countries. The establishment of the bureau is the result of recommendations made by President Dave Hennen Morris in his recent annual address. The cornerstone of the new clubhouse, Fifty-fourth street, west of Broadway, was laid Wednesday afternoon with appropriate ceremonies, with President Morris, who recently returned from the South, in charge.

Chicago Club's New Home.

CHICAGO, March 19.—The Chicago Automobile Club's new home will be located inside of the "loop" at 17 Plymouth place. President John Farson recently had the board of directors at dinner with him at the Union Club and the plans of the clubhouse were carefully gone over with the architects. The club will take possession of the property as soon as possible. There is at present a building on the site which will be razed and ground will be broken about May 1. Sydney S. Gorham, secretary of the club, estimates that the new clubhouse will cost in the neighborhood of \$150,000.

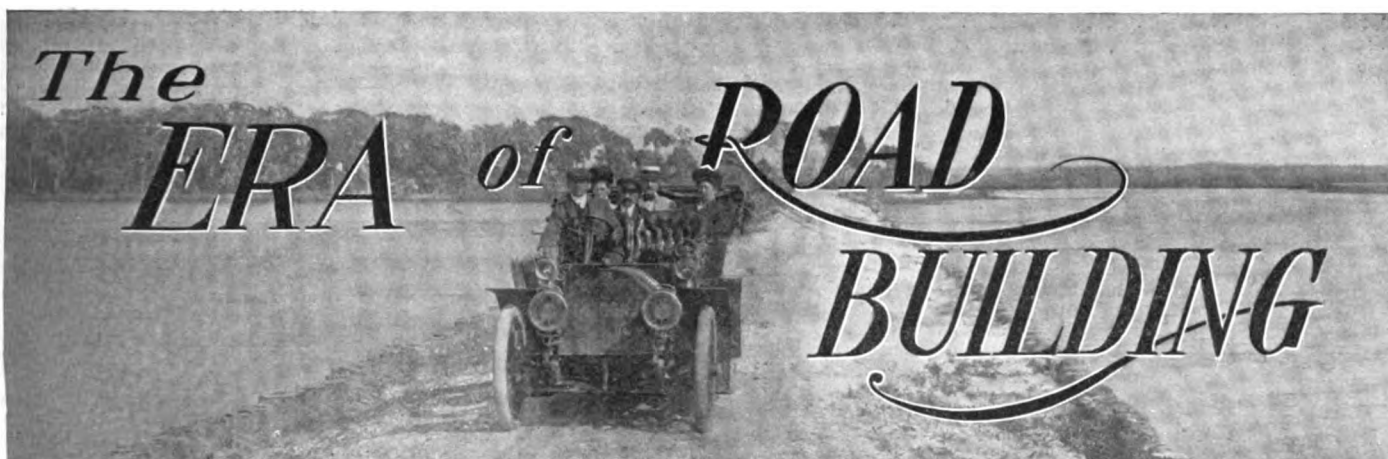
Several members of the club intend to form the "Chicago Automobile Club Auxiliary Association" with a capital stock of \$125,000, in shares of \$100, to finance the new clubhouse. It is the intention of these gentlemen to obtain articles of incorporation from the Secretary of State.

Quakers will Re-elect President Dick.

PHILADELPHIA, March 17.—Although the election has not yet been held, it is practically assured that William A. Dick, the present president of the Automobile Club of Philadelphia, will be re-elected. The officers are elected, not by the club, but by the Board of Governors, and the personnel of that body was completed last week by the election (for two years) of John R. Wiggins, J. Maxwell Bullock and Henry H. Roelofs. The holdovers are William A. Dick, Ex-President Isaac Starr, H. Bartol Brazier and J. Emlen Smith. The membership of the club is now close to the 300 mark. At last Monday's meeting thirteen new members signed the rolls, including Judge Martin, E. T. Stotesbury and others prominent in the city's professional and mercantile circles.

Orphans' Day in the Fall.

NEW YORK.—The New York Motor Club will repeat its orphans' day outing, but the event will probably be held in the fall instead of in the spring, perhaps following soon after the A. A. A. tour for the Glidden trophy. The club has a smoker scheduled for Friday evening at its rooms in the Hotel Cumberland, Broadway and Fifty-fourth street.



THE CAUSEWAY ACROSS ROSE BAY ON THE FLORIDA EAST COAST MOTOR HIGHWAY.

ORMOND, FLA., March 19.—The progress of road building in Florida is steady and promising, and before another winter rolls around there should be many miles for the northern tourist who visits the "Land of Flowers."

Just opened to automobilists is a 30-mile stretch from Ormond to New Smyrna, via Daytona and Port Orange, with eight additional good shelled miles beyond Smyrna. The automobile road from Jacksonville to Miami and beyond will be a reality sooner than has been anticipated.

Dade county, with convict labor, has completed eighty-four miles of rock road on this line, from a point two miles above West Palm Beach to Perrine (Cutler), sixteen miles south of Miami. Dade, Brevard and Volusia counties have already constructed over two-fifths of the great automobile highway. Its actual total length would be a trifle less than 400 miles. St. Johns and Duval counties have done little if anything.

One of St. Augustine's public-spirited citizens, Albert Lewis, has, entirely at his own expense, shelled six miles of the proposed route, covering the section south of St. Augustine south to Moultrie, and he is now having palmetto trees set on both sides the entire distance. Another public-spirited citizen of St. Johns county, P. L. Sutherland, has offered to give \$2,000 in cash and the use of five teams if the county will do the rest to extend Mr. Lewis's road twelve miles farther south to Pellicier's Creek. That would complete for St. John's county an eighteen-mile section of the big East Coast road. After that it would be an easy matter for St. Johns and Volusia to push the ends of their respective roads to a junction.

No part of the great automobile road would be so valuable to the winter tourist as the section between St. Augustine and Ormond. Investors stand ready to put an automobile livery of twenty first-class touring cars into St. Augustine as soon as that road is completed, and the Ormond and Daytona auto liverymen say that they could keep busy at least treble the num-

ber of machines they now use, as St. Augustine would be just the right distance for them to send parties there for dinner at the hotels and return in the afternoon. The great orange grove at Knox's and the fine old ruins at Bulow would be attractive features of this trip.

HIGHWAY PROGRESS.

The State Department of Agriculture has for distribution a pamphlet with the description of 1,700 New York state farms for sale or for rent which also states that they "believe that there are over 20,000 farms for sale in the state, and nearly all at such low prices and upon such favorable terms as to make them available for any one desiring to engage in agricultural pursuits, or have a farm house." Those advocating road improvement in this state say that they believe that this system of improved highways can be built in ten years, and when it is once built, that it will increase the farm values of the state an average of \$10 an acre, so that

the 266,720 farms in the state, which average about 100 acres each, would increase in value in the ten years the enormous sum of \$266,720,000.

The proposition embodied in the Brownlow-Latimer Good Roads bill now before Congress is but the development of an idea long held in the minds of economists and even of the wayfaring citizen who looks conditions in the face from the standpoint of practical fact. The general policy outlined is to bring about, so far as may be, a uniform system of taxation for road purposes and a uniform method of local construction, repair and maintenance throughout the United States, the general government, to co-operate with any state or political subdivision thereof in the actual construction of permanent highways.

Freyburg, Oxford county, Me., a township having 100 miles of highway, extending up and down hills, across valleys and exposed to the winds of the White Mountains, has been enabled in the past ten years to keep a double-track highway open the entire year at an average cost of 60 cents a mile, and a total cost per annum of \$600. The snow road roller costs from \$50 to \$75, and is made of wood, consisting of two drums about 5 1-2 feet high and 6 feet long. These two cylinders are fastened to one axle, the two center ends being about 6 inches apart. A pole is attached and four or six horses attached to the pole, according to the severeness of the storm.

Road Improvement Near Chicago.

WAUKEGAN, ILL., March 19.—Lake county makes the best showing of hard roads and highway improvement of any of the counties near Chicago, and the work is attracting the attention of automobile owners.

N. A. Curtis, a former Lake county surveyor, makes public an official report showing that there are 704 miles of public road in the county, and of this mileage 307 miles are graveled. Vernon township has 58 miles of graveled roadway. Libertyville township has 45 and two others have 30 miles each.

During the fiscal year there had been expended on the road system of the county \$49,752, or at the rate of \$70.45 a mile.



THROUGH THE NEW SMYRNA HAMMOCK.

EARLY ACTIVITY IN KANSAS CITY.

Kansas City, March 17.—All indications now are that 1906 will be the most prosperous year in the history of the local automobile trade. Many advance orders have been booked, and while the new models are, as usual, slow in arriving, demonstrations are already being given in the few that are here.

Activity in the automobile field has been increased by the beginning of operations in one home factory and announcement of the plans for a second, the projectors of which are now busy on their first model—a large car. The ending of what apparently was the last cold spell of the winter has caused a rush to put stored cars into commission, and a few weeks will see the whole automobile colony ready to enjoy the riding season.

Large cars will be the rule this season and most of the sales of the year promise to be of the touring car or limousine types. Runabout trade will be small, in the opinion of the best informed dealers, with only a single exception—the new four-cylinder Ford runabout model is bound to have a wide popularity, judging by the number of orders already placed. The Ford company, realizing that it could better its representation here by establishing a branch, has done so, putting C. C. Meade in charge. The quarters are the old O'Mara-Ledwidge garage on Eleventh street. The O'Mara company, after an unsuccessful season, has retired from business.

Another concern that has established a local branch is the Buick Motor Company, which is meeting with success in creating a demand for its cars. The company has a new garage at Fifteenth street and Virginia avenue, with ample facilities for the display of its cars as well as for all kinds of repairs.

The Missouri Valley Motor Company, which has the best appointed garage in Kansas City, is this year pushing the White, the agency having been taken over from the Kansas City Automobile Company, now out of business. The Kansas City company also handled the Ford two years ago. The Missouri Valley company also handles the Franklin and Locomobile.

Fred Pattee, of the Cadillac company, is now located at Central street and Goodrich place, where he has a commodious garage. He reports a lively demand for cars, especially of the large models.

Lemoigne & Obeirne are newcomers. They are confining themselves to repair work and to the agency for the Panhard. They occupy a garage at 1735 Grand avenue.

E. P. Moriarty & Co. are at their old stand on Grand avenue near Sixteenth street. They report a large demand for the Stevens-Duryea, of which cars they have already sold ten, or half their allotment. They also contracted for three Packards, but have released two of them to eastern agents for considerable premiums. Their line also includes the Pierce, Autocar, Winton and Olds.

QUAKER CITY NOTES.

Philadelphia, March 19.—The rivalry between the Reo and Maxwell followers in Philadelphia as to the relative merits of their favorites as hill climbers will in all likelihood be settled at the Wilkes-Barre climb in May. Quite a number of entries from both camps will be filed before the lists close, and the mountain road back of the town will see some determined driving if present indications count for anything.

The Cadillac "doctor's wagon" is making a hit in Philadelphia. The enterprising local agents, Foss & Hughes, are fairly over-

whelmed with requests for demonstrations from the Quaker City's disciples of Aesculapias and sales are being recorded just now beyond the agents ability to make deliveries.

The allotment of Pierce cars assigned to Philadelphia has fallen so far short of the demand that the local agents, Foss & Hughes, are now ransacking the various agencies and branches within 500 miles of the city in an effort to secure additional cars.

Alterations and enlargements are now in progress at the salesrooms of the Penn Motor Car Company, 680 North Broad street, to accommodate the concern's rapidly-growing business. The Penn Company is handling the Mitchell cars in Philadelphia and adjacent territory.

ST. LOUIS TRADE NOTES.

St. Louis, March 19.—F. M. Keeton, late of the Pope-Toledo factory in Toledo, O., has accepted the managership of the Mississippi Valley Automobile Company, of St. Louis, vice Harry S. Turner, Jr., who has decided to devote his active attention to the banking interests of Tracy & Co., of which firm Mr. Turner is a member.

The Maxwell Automobile Company, of which C. D. Harrington is manager, has taken permanent quarters at 3970 Olive street. Maxwell cars will be handled exclusively.

The Olive Automobile Company, 3970 Olive street, has taken the agency for the Rambler cars. The Bagnell Automobile Company, 4152-4156 Olive street, is handling in addition to the Cadillac, the Columbia and Northern lines.

The Wright Motor & Tire Company, 3924 Olive street, which made a specialty of repairing tires, has quit business and is offering their machinery and fixtures for sale.

The Morrison Automobile Company, 3968 Olive street, St. Louis, Mo., have taken the agency for the Welch car and also for the Viqueot.

The Halsey Automobile Company, 3914 Olive street, has added the Buick to its line, which also includes the Packard and Franklin cars.

ACTIVITY AT THE CADILLAC PLANT.

Detroit, Mich., March 19.—Important changes are being made at the plant of the Cadillac Motor Car Company at Cass avenue and the railroad. The company, which now claims to be the largest manufacturer of automobiles in the world, will nearly double the capacity of its plant. The company is now turning out about thirty good sized machines a day. This output, when the alterations are completed, will be increased to fifty per day.

Besides this preparations are being made to go into the manufacture of four-cylinder machines. When this branch is completed the company will turn out at least 400 four-cylinder touring cars per year, besides over 2,000 smaller machines.

The new buildings are all constructed of reinforced concrete and steel, and are as fireproof as they can be made. Besides the tanks on the roof, there is a reservoir beneath the plant which holds 200,000 gallons of water. The factory is scrupulously clean, even the machine shop being free from dirt. Every convenience has been arranged for the 1,200 hands now at work, and when the increased output is arranged for, about 1,000 more men will probably be added.

"It is simply impossible for us to keep up with our orders," says Sales Manager W. E. Metzger. "We are turning out more than thirty machines a day, making almost all of the parts here, and we must have a capacity of fifty machines before we can catch up."

MICHIGAN TRADE ITEMS.

Pontiac, Mich., March 19.—The addition of the business of the National Body Company, of Mt. Pleasant, next month, will mean considerable to the industrial growth of the city. The factory will be located in the C. V. Taylor carriage plant, and it is stated that Mr. Taylor will devote his attention to another line.

The Rapid Motor Vehicle Company, of Pontiac, is getting settled in its new factory, and Manager Grabowsky plans to increase the output at once.

Jackson, Mich., March 19.—The matter of the insolvency of the Jackson Body Company has been adjusted and the creditors satisfied so that a new deal is now ready to be pushed forward. The Jackson Body Company and the Monroe Body Company, of Pontiac, have joined issues and the reorganization will control two plants, one at Pontiac and the other at Jackson. It is planned to enlarge the Jackson plant at once and get ready to employ many more hands. R. F. Monroe, of Pontiac, was in the city recently and families are already commencing to come to Jackson because of the promised employment. The organization, both at Jackson and Pontiac, will manufacture nothing but automobile bodies. It will be known as the Monroe Body Company.

The Maumee Motor Car Works, of Dundee, Mich., has capitalized at \$100,000.

TWYFORD FOUR-WHEEL-DRIVE CARS.

Pittsburg, March 19.—The Twyford Motor Car Company has on exhibition the chassis of its car at the Empire building in this city. The car is manufactured in Brookfield, Pa., and is the invention of R. E. Twyford. The company is now turning out six cars a week, it is said, and has a capital of \$500,000. Its building stands on a ten acre site. A. D. Deemer is president, W. N. Humphrey vice-president, D. L. Taylor secretary and treasurer, R. E. Twyford general manager, and H. C. Beach, W. N. VanLeer, C. A. French, William D. Shields and Edward A. Carwalt, all of Brookfield, are directors.

The car is built especially for road work. All four wheels are drivers, automatically compensated; the front axle is oscillatory and can be raised or lowered 20 inches at either end without twisting the frame; there are four brakes and the engine is valveless. There are eight different styles of the Twyford; a five-passenger touring car, and four-passenger tonneau; two and four passenger stanhope, roadster, two-passenger runabout, six, ten or fifteen passenger 'buses and four styles of delivery and express wagons.

CHICAGO TRADE NOTES.

Chicago, March 19.—John Mitchell, formerly superintendent of the Moline Automobile Company's works, has joined the sales staff of the Chicago Ford agency.

The G & J Tire Company will occupy its retail quarters on Automobile "row" about May 1.

W. H. Durphy has resigned his position as manager of the Chicago branch of the Electric Vehicle Company, and has accepted a similar position with the New York branch of the Monarch Typewriter Company.

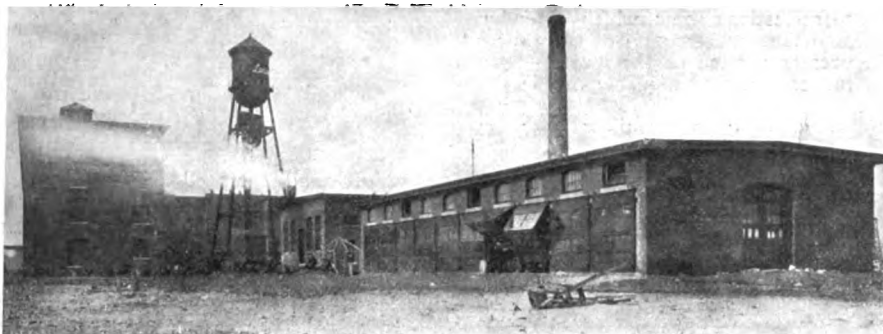
MOVE OF THE STUDEBAKERS.

From South Bend, Ind., comes a confirmed report that the Studebakers have invested over \$250,000 in the plant of the Garford Manufacturing Company, at Elyria, Ohio, makers of automobile chassis and parts. The factory will be increased in size to meet the demands upon it from the trade.

Great Activity in Garage Construction.

An original idea in garage construction has been carried out by the Locomobile Company, at Bridgeport, Conn., where the garage in question has been built as an addition to the company's

Located in the heart of the Connecticut good roads district, and on the direct route between New York City and Boston, New Britain is a favorite stopping place for automobilists, and its excellent macadam



GARAGE AT THE LOCOMOBILE FACTORY IN BRIDGEPORT, SHOWING SPECIAL DOORS.

already extensive plant. Practically one side of the building, which is constructed of brick, consists of specially designed doors which, when lowered, admit plenty of light, and which, when open, form an awning-shaped roof over the doorway. In the illustration four doors are shown in various positions—one has been partly lifted, others are opened wider, and one is open as far as it will go, giving plenty of clearance for any touring car with the top up. The doors are very easily moved, the weight being balanced, and they will stay in position without hooking. The bottoms of the doors are held by guides fixed in the doorways, and their practicability is their strongest commendation, as no shifting of cars inside the building is necessary when it is equipped with doors of this type. Ingress and egress are rapidly and satisfactorily made.

A forced draught system of heating has been installed. It consists of a long pipe with open ends running the full length of the room, and from around a steam coil air is forced by a blower into the pipe and through the various openings. A sort of mezzanine floor is located at the end with lockers for the use of chauffeurs, and a staircase leading to this floor is hinged so that it may be hung up when not in use, and thus be out of the way. The floor is all concrete, with eight pits. Another feature is an enclosed telephone booth in connection with the offices.

Another one-story brick building, 45 by 25 feet, is being added to the Locomobile plant in order to relieve the crowded condition of some of the other departments.

A GARAGE OF NEW BRITAIN.

New Britain, Conn., is a city of about 37,000 inhabitants. Considering its size, it is of more than ordinary importance as a manufacturing center. The great Corbin interests alone employ more than 6,000 operatives.

roads are well dotted with automobiles every day of the year except when deep snow makes the running too heavy.

The growth of the Corbin automobile interests brought with it a demand for proper garage accommodations, and to provide suitable accommodations for their patrons and the general public the Corbin Company erected a garage which, for completeness of outfit will rank with the best auto garages in the larger cities. The construction is entirely of brick, steel and glass, with a cement floor, with dimensions 45 feet front on Chestnut street by 150 feet in depth, and this entire space is free from columns or uprights of any kind. The glass sashes which extend from the roof to within three feet of the floor cause the entire establishment to be unusually well lighted. In the brickwork at the base of the walls are openings and the roof is equipped with ventilators which provide an undercurrent of air to keep the atmosphere clear of vapor and smoke. The office and retiring rooms are located in the front. A repair shop with electrically-driven machine tools is in the rear, where light repair work can be done, the heavier class of repair work being done in the factory. Some thirty-

five storage customers already use the garage, which has a constantly growing clientele of patrons. It is kept open day and night during the season.

THE GROWING GARAGE LIST.

INDIANAPOLIS, March 19.—The Fisher Automobile Company, which has the largest garage in this city, is making an effort to find a location in Cincinnati, and, if successful, will open one of the largest garages in the West. An unsuccessful effort was made by the company to lease a seven-story building in that city, and at present no other suitable locations are in sight. The company does not intend to close its local establishment. It is understood that Indianapolis cars would be handled at the Cincinnati branch.

A new salesroom and garage has been opened in Chattanooga, Tenn., at 725 Cherry street, under the name of the H. D. Stebbs Automobile Co. At the head of the company is H. D. Stebbs, an expert machinist, who has been connected with the machine shops of different railroads for the last twenty-five years. Frank C. Hoke, of Cincinnati, is in charge of the repair department. The company will act as sole agent for the Rambler and Reo cars. It has installed considerable machinery and will have a complete establishment.

Construction of a large stone garage is to be started at once in Morristown, N. J., on a plot of ground having a frontage of 80 feet on Pine street and a depth of 192 feet. The land has just been purchased by a new partnership formed on March 1 and known as Victor A. Wiss & Bro. The new building is to be 50 by 180 feet, affording 9,000 square feet of floor space. Plans have been drawn for all such conveniences as waiting rooms for men and women patrons, smoking room for chauffeurs, and lockers, and all the machinery required to make this one of the most complete establishments of the kind in the state will be installed. It is hoped to have the place ready for occupancy by June 1, when the partners will move from their present location at South and DeHart streets, Morristown.



FIREPROOF AND WELL-LIGHTED CORBIN GARAGE IN NEW BRITAIN, CONN

News and Trade Miscellany.

George H. Berg, 8 Motor Mart, Boston, has been appointed agent for Berkshire cars in Boston and the vicinity.

The Columbus Screw & Machine Co., 224 Kaiser street, Columbus, O., has just been appointed agent for the complete line of Wayne cars.

By a change of agencies in Columbus, Ohio, the Wayne cars will be handled there this season by Charles E. Bell instead of the Columbus Screw & Machine Co., as previously announced.

The Boston Fire Department has purchased a set of Kilgore air cushions for use on the fire chief's official car, after an examination of all the devices for the same purpose at the Boston show.

The Cincinnati police department will be provided with an automobile patrol, costing \$3,500. The board of public service, health department and street cleaning departments will be equipped with automobiles also.

The Baldwin Locomotive Works, of Philadelphia, one of the world's greatest builders of steam locomotives, has purchased a Winton Model K automobile in which to carry visitors to and from the big Baldwin plant.

A new concern in the manufacture of radiators and hoods is the Wright Cooler & Hood Mfg. Co., 335 Wabash avenue, Chicago, which is bringing out an entirely new style of radiator, said to be very efficient and light in weight.

Henry Lee, of Salina, Kans., formerly an official of the Tobacco trust, has purchased a Pierce, with which he intends to make a tour of Europe as soon as he can pick up a linguistic chauffeur. The tour is to be principally in Germany.

Charles Morgan, the wealthy grandson of the founder of the Morgan steamship line, who has just returned from a trip through Mexico and the West Indies, is to assume the management of the Crawford car agency at 152 West Fifty-sixth street, New York.

The distinction of having the largest automobile stable in Kansas City belongs to Baron W. R. Nelson, of the *Star*, who has a Mercedes, a Panhard and a Pope-Toledo. The Pope agency is held again this year by Joseph Wittman, who had the agency last year.

During the Chicago show, in demonstrating the use of Green Oil soap, a wood panel, highly polished, was sudsed, cleaned, and washed with strong suds of Green Oil soap 1,350 times, and at the conclusion the finish and polish of the panel was even finer than when the operation began. The demonstration was made at the stand of the Excelsior Supply Company.

What is considered a compliment to the constructive reliability of an American automobile is the recent selection of the new four-cylinder Pope-Hartford by Robert Graves, of New York City, one of the prominent automobilists in this country. Mr. Graves not only went over this car thoroughly and had a long demonstration, but even went so far as to examine the connecting rod bearings, which, he stated, are quite as large as those in his "45" (naming a famous foreign car).

A report filed recently in the circuit court of Wisconsin by a board of commissioners appointed to appraise the value of a 100-foot strip of land belonging to Thos. B. Jeffery & Co., of Kenosha, and occupied by the Chicago and Milwaukee Electric Railroad, awarded the makers of the Rambler cars \$50,508 to cover the damages alleged. The

extension of the interurban line through the property prevents the company from extending its factory to the west, as contemplated. Of the total amount of the award, \$2,000 is to repay the cost of the foundation for an addition to the plant which cannot now be utilized as intended, and \$2,000 is for damages to the testing track, which is rendered useless by the construction of the railroad. The greater portion of the award—\$45,000—is for depreciation in value of the property.

About May 1 the M. E. Brasier Mfg. Co., of Utica, N. Y., will occupy the new building which it is erecting at 65 Columbia street, for the manufacture of a full line of extension and Cape tops. The company has secured the services of G. A. Mackey, formerly with the Sprague Auto Top Co., under whose supervision the factory will produce tops of different styles for all types of cars.

The New York branch of the Motz Clincher Tire & Rubber Co., Akron, Ohio, is now located at 1773 Broadway, between Fifty-seventh and Fifty-eighth streets, in the heart of the automobile district. The branch is in charge of Herbert C. Comstock formerly associated with the Swinehart company as New York manager, at the same address, who has been connected with the rubber tire trade for several years.

Macnaughton & Du Broy, Inc., of Buffalo, have rented from the Motor Vehicle Garage Co. the sales floor at 1133 to 1137 Main street, that city, and established one of the best salesrooms for automobiles in that part of the state. It measures 42 by 150 feet, is without posts, and finished in hard wood. The concern has secured the agencies for the cars handled by Smith & Mabley, Inc., including the Mercedes, Panhard, Renault and S. & M. Simplex.

The National Coil Company, of Lansing, Mich., which has been occupying quarters with the Capital Electric Engineering Company at 115 Michigan avenue, East, for the last two years, has outgrown its present quarters and has leased a four-story brick building on Michigan avenue, East, and will occupy it about March 15. The company has thirty-seven employees, but as soon as it is installed in its new location seventy-five hands will be employed.

A double ignition system will henceforth be fitted to one style of the Lozier type D 40-horsepower cars, a set of firing plugs set in the inlet valve covers being connected to a Remy or Simms-Bosch magneto on that side of the motor and another set in the exhaust valve covers being connected to a storage battery and distributor. This double system enables the operator, in event of any trouble with one system, whether in the magneto or battery, in the wiring, coil, or plugs, to instantly switch the other system into use.

The third edition of "Kinks," a small booklet which treats of the difficulties experienced by automobilists and gas engine users and the remedies therefor, is being distributed by the National Carbon Co., of Cleveland. The little book is said to be the best authority thus far published on ignition troubles and problems. It embraces other valuable information and illustrations showing several practical ignition schemes. A copy will be sent to any automobile or gas engine owner upon application.

Invasion of the foreign market by the Rushmore searchlight has reached a point where the subject becomes one of marked

interest to all interested in the success of American-made automobile fittings abroad. In France especially the Rushmore is finding a very large sale, and although the heavy rains of the past few months have made motoring difficult in that country, the Paris agency of the Rushmore Dynamo Works has kept the factory busy filling orders. Many prominent foreign motorists have equipped their cars with the Rushmore light, among them M. Charley, the representative of the Mercedes interests; Baron Henri de Rothschild, René de Knyff, director of the Panhard Company; M. Galland, of Rosières de Picardie; the Prince de la Tour de Auvergne, and others. James Gordon Bennett, whose private Paris garage houses his six Mercedes cars, has them all equipped with some fifteen Rushmore searchlights.

The Anderson Forge & Machine Company, organized in Detroit with \$150,000 capital stock, has bought the buildings of W. H. Anderson & Co. at 21-31 St. Aubin avenue, Detroit. The purchase includes the complete equipment of steam hammers and other machinery for the manufacture of a full line of crankshafts, steam-hammer forgings, and tools and a large part of the stock on hand. Drop hammers and presses will be added to the equipment as soon as the machinery is received from the manufacturers.

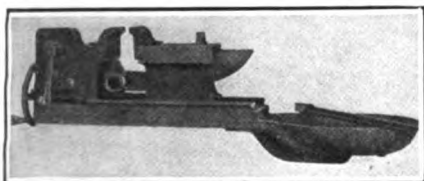
The uptown sundries and supply store of Chas. E. Miller, in New York City, has been moved from the old "automobile row" in Thirty-eighth street to 924 Eighth avenue between Fifty-fourth and Fifty-fifth streets, where it is within a few hundred feet of the new clubhouse of the Automobile Club of America, and but a block west of the new Broadway "row." The new store is to be kept open until 9 o'clock at night and until noon on Sundays and holidays for the convenience of garage managers and automobile dealers in the neighborhood.

Without proper oiling no car will do its work, and many a novice has scarred his cylinders, ground out his bearings, badly damaged his transmission or otherwise abused his car through not realizing the importance of this fact. Instruction books are read at random, laid to one side, or lost with persistent regularity, and some of the makers are making special efforts this season to convince purchasers of the necessity of keeping their instructions and following them. The Electric Vehicle Company has adopted a system which is rather novel and is working successfully. A printed sheet with complete instructions for oiling is pasted on the under side of the forward seat and shellacked. Under this plan there is no possibility of the instructions getting lost or even temporarily mislaid. The company also issues more complete general instructions in pamphlet form.

Illinois free postal delivery carriers are looking for some kind of a conveyance with which they can cover their routes in less time than is now required to earn their \$720 a year. This winter some of the carriers have had to use two horses hitched to a two-wheeled cart. They have been put to heavy expense in maintaining the horses through the winter. In the summer season, or for about seven months in the year, the roads are such that an automobile could be taken around a twenty-five mile route in quick time. This will enable the carrier to put in more time at some other work by which he can make up for what he loses in the winter. More gravel road is being built, and in some sections the roads will be good nearly all of the year. The carriers are looking for a machine that will be serviceable enough and cheap enough to serve their purpose.

INFORMATION FOR BUYERS.

COMBINATION TOOL.—Under the name of the Detroit combination tool, the Detroit Tool Co. is offering, through its selling agents, Calnon & Dennis, 19 Peninsular Bank Building, Detroit, a shop tool that should be of especial interest to the private garage owner and the small repair shop man. It should be a great economizer of space, as it comprises in combination a forge with geared rotary blower, an anvil with 4 by 8-inch chilled face, a vise with 4-inch jaws opening 10 inches, a pipe vise



DETROIT COMBINATION TOOL.

with tempered tool steel jaw, an emery wheel with geared power, a drill press with encased gears, and such supplementary articles as vise clamps, anvil handy, twist drill and blacksmith tongs. A larger size of this same combination tool, called Model B, weighs 225 pounds and has a bed piece measuring 30 by 8 inches, steel faced top and bottom. The anvil is 8 inches high and 15 inches long; the vise jaws are steel faced; pipe vise jaws have capacity for 1-2 to 4-inch pipe; emery wheel is 10 inches in diameter, and forge pan is 14 1/2 by 16 inches.

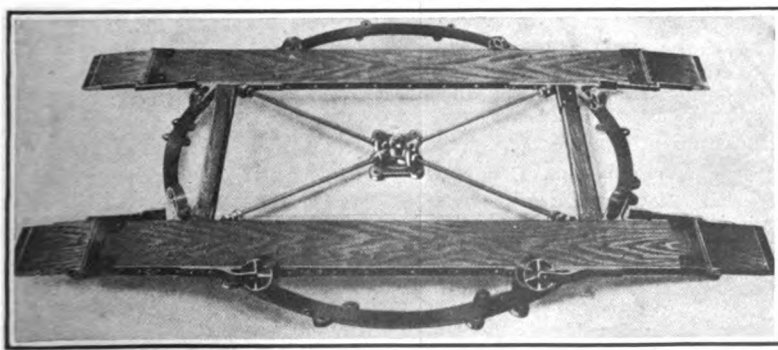
NAME PLATES.—The Electro-Chemical Engraving Company, 450-458 Nineteenth street, Brooklyn, N. Y., is offering to the automobile trade a line of name plates etched in brass for attachment to cars and all sorts of machine tools. These are made in any desired style and size and are artistically designed. The wording appears in raised letters on a dead black sunk background. Holes are provided in the ends of the plates for attaching to the machinery. The design is etched shallow or deep, as preferred, but the company recommends deep etching, since it is more enduring. The makers, who received the highest award for metal name plates at the St. Louis Exposition, also manufacture clock and meter dials, scales, metal signs, etc.

PITLESS TURNTABLE.—A new device that commends itself at once to the private car owner and the small garage proprietor is a turntable manufactured by the Pitless Turntable Co., of Kansas City, Mo., and illustrated herewith. As its name implies, this is constructed so that it can be laid upon and screwed down to the floor of a garage or stable without the necessity of

constructing a special pit. The turntable is made in two styles, one having the inclined approaches attached, as shown, to the table so that they revolve with it, counterbalancing weights keeping the ends of the inclines raised half an inch from the floor, and the other having the approaches detached so that they remain stationary when the table turns. The first style is for use in public garages and the other for private garages. In the second style the table locks in position when it is in alignment with the approaches. It can be released by stepping on a lever. The Pitless turntables are made in three sizes as follows: 108 inches in diameter, for cars of 100 inches wheelbase; 124 inches diameter, for 120-inch wheelbase, and 140 inches diameter for 134-inch wheelbase.

CHIME SIGNAL.—The Orpheus Chime is the name given to a new form of automobile alarm made and sold by the Central Garage, 330 East Market street, Indianapolis, Ind. Although bearing a general resemblance to the three-tube chime signals which became popular during the past season, and designed to be attached in the same way to the side of the car and sounded by the exhaust from the engine, there are many points of difference. Instead of being round the tubes are rectangular; the horn can be taken apart, cleaned and reassembled, it is said, in three minutes; and the pitch drums are attached outside of the tubes by wings and have a double adjustment. A special valve is supplied to adapt the chime for use on a steam car, and the makers also supply upon demand a bellows by which the signal can be blown on an electric vehicle by the pressure of the operator's foot. As no solder is used in the construction of this horn, it will withstand excessive heat from the exhaust of a gas engine.

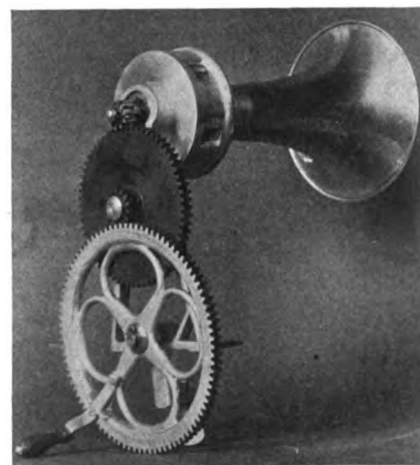
CUSHION TIRES.—Susceptibility of the ordinary pneumatic tires to puncture and consequent deflation has induced the Ideal Auto Tire Co., of Detroit, Mich., to place in the market a special tire named the Ideal, which does not depend upon compressed air for its resiliency. Instead, this tire, which closely resembles the outer shoe of a detachable pneumatic tire, has wound circumferentially within it a thirty-foot band of spring steel, like a clock spring. This spring has a tendency to expand or unwind and consequently lies snug against the inside of the tire tread, leaving an air space of two inches or more between the spring and the iron tire of the wheel. The tire shoe has deep sides with beads on their edges and is secured to the wheel felly by means of flat steel segments bolted together through tire and felly. The beads prevent the tire pulling out.



PITLESS TURNTABLE, WITH INCLINED APPROACHES ATTACHED.

SHOCK ABSORBER.—An improvement has just been made in the Vestal shock absorber, made by the Vestal Shock Absorber Company, 5917 Baum Street, Pittsburg, Pa. By the use of two coil springs in the connecting arm between the friction arm and the vehicle spring, a movement of two inches between the car frame and spring is allowed before the friction of the drum begins to resist the movement in either direction. In passing over an obstacle, when the car axle starts upward the lower spring in the connecting arm is first compressed upward against a collar pinned to the upper section or plunger of the arm until it has been compressed to the limit, when the friction drum begins to check the movement. When the car spring starts on the rebound, the lower coil spring in the connecting arm first relaxes to its normal position and compression of the upper spring begins. When this spring has been fully compressed the drum begins to check the rebound. By this construction the car spring retains its full flexibility within certain limits, beyond which the friction device counteracts the severe shocks.

HAND-OPERATED SIREN.—The Leavitt siren shown herewith, is made by the Uncas Specialty Company, of Norwich, Conn., especially for use on power boats. Instead of utilizing the motion of the engine flywheel



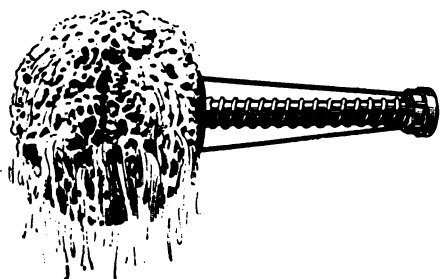
LEAVITT HAND-OPERATED SIREN.

to sound the alarm, as on an automobile, the Leavitt is geared to be turned by hand. It is claimed that it can be heard from three to five miles, and that all the different navigation signals can be given.

TIRE FILLER.—A new composition for filling pneumatic tires to make them non-deflatable in event of puncture has been discovered by Dr. W. G. E. Flanders, Church street, Burlington, Vt., who has also devised a method for introducing the compound, which he calls Glumatic, into tires. The filler is introduced into the tire in a hot, gelatinous form, and afterwards solidifies. During the process of filling, air is pumped into the mixture so that it is thrust into the tube full of bubbles, thereby increasing the resiliency. The compound is pumped into the tires through a rotary joint, allowing the wheel to revolve all of the time. The process is continued until there is an internal pressure sufficient to hold up the load each particular tire is expected to carry. There is from ten to fifteen pounds more pressure on the rear than on the forward wheels of a machine. The composition is neutralized by a chemical process

so that heat and cold have no effect on it. The Glumatic filler is registered at Washington, its composition being such that it can be better protected under trade-mark than by patent.

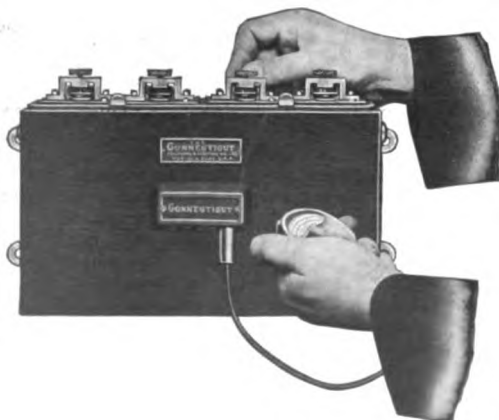
CARRIAGE WASHER.—An improved washing device for automobile and carriage bodies has just been patented and put on the market by the Ideal Carriage Washer Company, 148-152 Lenox street, Rochester, N. Y. It consists of a metal nozzle for attachment to the end of a metal tube constituting a handle, which is attached in turn to a hose. The nozzle has four external rods with interturned prongs which grasp a sponge and hold it directly in front of the water spray. Sliding on the central tube of the nozzle is a hard rubber cup with four holes, through which pass the four rods that hold the sponge. A spiral spring wound around the tube forces this disk to the end of the nozzle so that the cup draws the prongs together, burying them deeply in the sponge so that they cannot scratch the varnish on a body. When it is desired to release the sponge and use the washer



IDEAL CARRIAGE WASHER CO.'S IMPROVED WASHER.

merely as a hose nozzle the rubber cup is drawn back, compressing the coil spring and separating the prongs. The device fits any ordinary hose connection. The rubber cup is brass lined, as are also the holes in which the rods slide.

COIL CURRENT INDICATOR.—An instrument designed to show the exact amount of current that is being drawn from the ignition battery, so that the coil can be adjusted properly, has been brought out by the Connecticut Telephone & Electric Co., of Meriden, Conn. This is called the Connecticut coil current indicator. It consists of a special form of indicating meter suitable for holding in the hand and having attached to

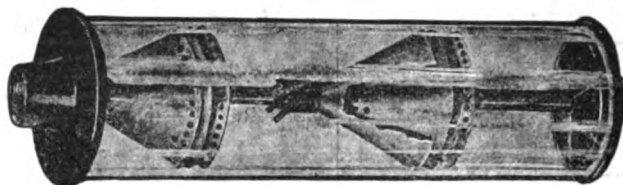


CONNECTICUT BATTERY CURRENT INDICATOR.

it a double conducting cord and metallic circuit plug. To use this instrument, the running plug is removed from the coil and the metallic plug on the end of the indicator cable is inserted into the jack from which the running plug has been taken. This throws the indicator into circuit, so that

the amount of current passing through the coil can be determined. In adjusting a vibrator, increasing the tension increases the amount of current passing through the coil, and in most cases the person who does the adjusting sets the tension so high that it consumes more current than is actually required to do the work, not only wasting current but burning the contact points. If the coil is correctly made and the proper current is used to operate it, the result should be the almost total elimination of coil and battery troubles.

MUFFLER.—Under the name of the Ejector muffler, the Motor & Mfg. Works Co., 107 North Albany street, Ithaca, N. Y., is



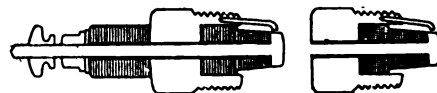
EJECTOR PRESSURE EQUALIZING MUFFLER.

offering in the market the muffler shown in the accompanying illustration. This is designed to take care of the exhaust of high-speed four-cylinder engines. It is divided into three expansion chambers formed by a series of cones nested together and perforated, some at the outer edge and some near the apex at the center. The cones are held apart by U-shaped distance pieces that allow them to give when subjected to the force of the exhaust gas as it enters the muffler. All parts of the muffler are in use simultaneously. The gas entering the muffler from the exhaust pipe fills the first chamber. A proportion of it flows through the center pipe into the second chamber, and another proportion passes on through a smaller center pipe into a third chamber, while a portion is passing out through the nozzle directly into the exhaust pipe at the outgoing end. The pressure in the first chamber will be higher than that of the second chamber. While the pressure of the third chamber will be less than that of the second until the gases passing through the cones enters these chambers and brings them all to a uniform pressure, which is much lower than would be the case if the gas was allowed to fill the muffler instantaneously. By this arrangement most of the gas has issued from the muffler before the piston starts for its return or exhausting stroke, and the gas is muffled effectively without back pressure. The Ejector mufflers are in use on engines of from 1 horsepower to 300 horsepower. In the last two years the makers have, they claim, put more than 11,000 mufflers into actual use.

LEATHER TIRES.—A pneumatic tire in which no rubber is used except in the air-tube is manufactured by the Salisbury Tire Company, of Owosso, Mich. The makers claim that with this tire the expenses that are usually inseparable from the use of pneumatics are almost eliminated, while the resilience is retained. The tire is made of a number of layers of leather, elk sole leather being largely used, the inner lining, next to the air tube, being of a friction fabric. It is said that the Salisbury tire is water proof and is lighter than a rubber pneumatic tire of the same size. These tires are made for both clincher rims of the ordinary type and for Dunlop detachable rims. Special attention is called by the manufacturers to the anti-skid bands, which are studded with steel knobs so inserted that they cannot be loosened.

SPARK PLUG.—The accompanying drawing shows the longitudinal section of the

"Rich spark" plug made by the Richardson Engineering Company, of Hartford, Conn., manufacturers of electric charging outfits and electric light and ignition outfits for launches, yachts, clubhouses and residences.



The drawing shows two types of sparking end, one on the right having the insulating mica chambered to insure against any short-circuiting through the collecting of soot around the end of the plug and spark

pin. The threaded central portion of the plug is a brass shell, and the firing pin extending through it is carefully wrapped with India sheet mica. Disks of mica are forced over this at both ends and packed together under great pressure. The pressure developed in the engine cylinder by the exploding charges only serve to pack this insulation tighter. There is no packing to blow out and the plug is easy to clean.

Index to Advertisers

Acetylene Gas Illuminating Co.	50
Acme Motor Car Co.	96
Add-Wear Tire Sleeve Co.	49
Aerocar Co.	97
Am. Anti-Puncture Tire and Auto Co.	69
American Coil Co.	50
American Generator Co.	62
American Lubricator Co.	55
American Machine Mfg. Co.	55
American Shock Absorber Co.	84
Anderson Forge & Machine Co.	55
Archer & Co.	50
Ashton Valve Co.	49
Aster Co., L.	81
Atwood Mfg. Co.	50
Auburn Automobile Co.	92
Auto Front Drive Mfg. Co.	72
Auto Pump Co.	55
Auto Safety Starting Crank Works.	55
Auto Top and Equipment Co.	54
Automobile Equipment Co.	61
Automobile Supply Co.	51
Badger Brass Mfg. Co.	56
Baker Motor Vehicle Co.	96
Baldwin Chain Mfg. Co.	55
Ball-Flintze Co.	77
Bates Forge Co.	51
Bemus, T. Alton.	76
Bentley, Joseph.	57
Berkshire Auto Co.	Cover
Beverly Mfg. Co.	55
Bicycle Step Ladder Co.	71
Boker & Co., H.	50
Boston Mechanical Co.	57
Bowser & Co., S. F.	61
Brasler Mfg. Co., M. E.	54
Brennan Motor Co.	60
Briscoe Mfg. Co.	55
Borbein & Co., H. F.	59
Brown, R. E.	64
Brown Talbot Machine Co.	62
Brown & Co., S. N.	54
Brownell-Trebert Co.	60
Buckeye Mfg. Co.	100
Bullard Automatic Wrench Co.	Cover
Bullard, J. H.	63
Buob & Scheu.	54
Burdick-Putnam Gasoline Engine Co.	51
Byrne-Kingston Co.	77
C. B. & Q. Ry. Co.	61
Cadillac Motor Car Co.	106
Capitol Foundry Co.	55
Carbondale Chemical Co.	50
Carr, S. F.	80
Central Garage.	51
Champion Co., Albert.	49
Champion Mfg. Co.	49
Chase & Co., L. C.	63
Chelsea Clock Co.	49

THE AUTOMOBILE

VOL. XIV.

NEW YORK—THURSDAY, MARCH 29, 1906—CHICAGO

No. 13

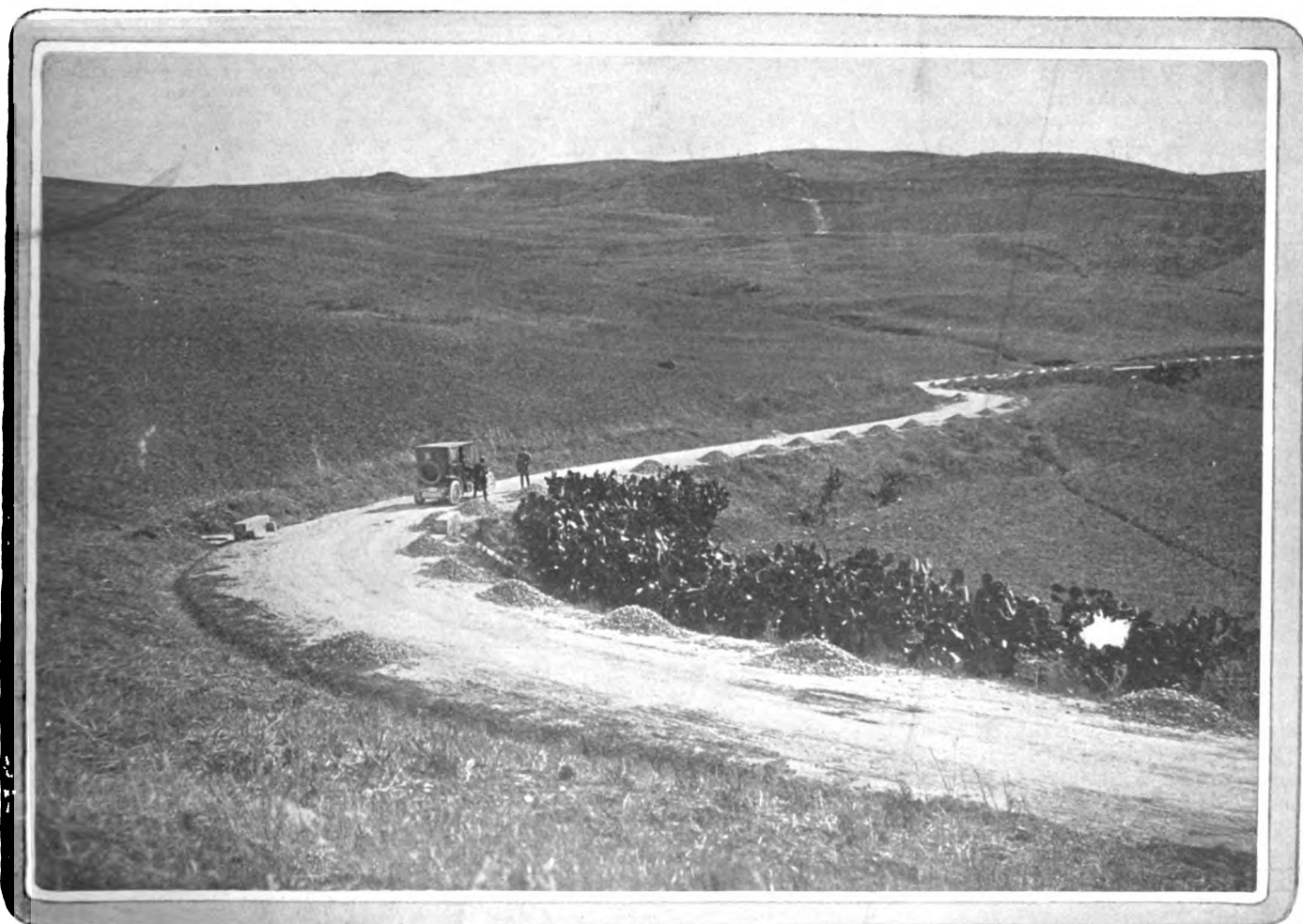
FIRST OF THE EUROPEAN TOURING CONTESTS.

PARIS, March 20.—First of the several important European touring contests for the coming season will be the Sicilian Circuit for the Targo Florio, scheduled to take place May 6 on the Island of Sicily. Chevalier Vincenzo Florio is the organizer of this picturesque event, which will try, in no easy manner, the rugged qualities of a first-class touring car. As a preliminary to

the tour the Chevalier has traveled over the chosen route and reported on it in this manner: "The road is grand from Cerda to Caltavuturo, but soon after passing the latter place, notably between Petralia to Castellbuono, where the road attains an elevation of 1,400 metres (4,550 feet) above sea level, the surface becomes bad. Fairly good from Castellbuono to Campofelice, it leaves

much to be desired between the latter place and Cerda—that is, the portion particularly which skirts the sea, and whereon the grandstands will be placed.

"Having regard to the difficulties of the route, it is probable that two and not three circuits will form the distance. This event is confined to touring vehicles of a chassis cost of less than £800, and of types of which



TYPICAL STRETCH OF SICILIAN ROAD WHICH WILL BE TRAVELED IN THE TARGO FLORIO CUP EVENT IN MAY.



NEAR ISUELLO THE SICILIAN SCENERY BECOMES SUBLIME WITH SNOW-CAPPED MOUNTAINS.

a series of not less than ten must have been constructed before the date of the closing of the entries."

Everybody in Sicily is actually at work for the material organization of the competition and the last mails inform us that the Sicilians are positively enthusiastic over the coming of the automobile caravan. It also must be known that the frame in which the famous course is placed is really splendid, and the most picturesque in the south of Europe.

The start will be near to Termini—six kilometers from the latter town and forty kilometers from Palermo. The road is bordered by enormous rocks on one side and precipices on the other. Soon after Palermo the automobilists will reach a magnificent straight line alongside the sea, parallel to the railroad track that goes to Cefalu. This part of the road is level for about ten kilometers, and absolutely straight up to the Aqua Camuni, where it turns slightly to the right, going towards Collesano. Then, it is again the abrupt mountain which goes up and down and makes zigzags at terrific height. Then the cars plunge down to Isnello and Castellbuono. After crossing Castellbuono the circuit continues by sinuous roads until Geraci is reached. From there they will climb a very strong hill that leads to Petralia Soprana, a culminate point of the circuit situated at 1,400 meters above the sea level.

Then the road descends nicely to Petralia Sottana, Castellana, Caltauturo. Near this town is the most difficult double turn of the circuit, being an up-and-down-hill one, at a very sharp angle. Finally by Cerda and many more sinuous roads the course comes back to the starting point.

The circuit will be driven on the right hand. In this competition the cars will certainly have to show all their qualities.

The country traversed by the course is marvelously sublime. Now the roads dominate profound vales, full of the roar of furious gulches; then, on the contrary, it is squeezed in narrow gorges bordered by high walls, on the top of which ruins of ancient castles are perched like eagle nests. Sometimes also a brigand's hut shows its straw roof between two high, black rocks visited by vultures.

The Executive Committee of the Targa Florio expects the greatest success, and the principal automobile firms of Italy, as well as the majority of the French, German, English and Belgium firms, have entered their best teams to dispute this competition.

An American Maker's Opinions

BUFFALO, N. Y., March 26.—George N. Pierce, the well-known automobile manufacturer, announced yesterday that within a few weeks his son, Percy P. Pierce, will start the American invasion of Europe by taking part in the principal touring contest of France, Italy, Germany and England.

Mr. Pierce, in regard to the manufacturing of automobiles, said:

"American manufacturers can compete with foreign manufacturers in making auto-

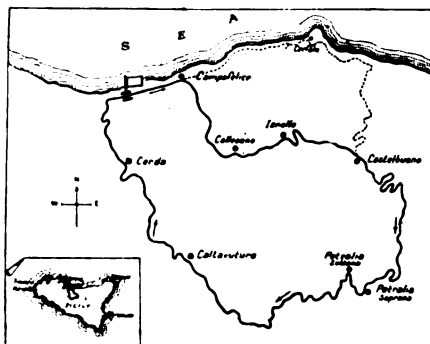
mobiles, and within the next two years the importation of foreign makes will cease entirely. The main trouble in manufacturing automobiles in this country has been that we could not get steel of the proper quality.

"When we ordered steel from an American manufacturer he asked how many hundred thousand tons we wanted, and we were forced to reply, 'We don't want hundreds of thousands of tons, but fifteen tons.' This steel, however, had to be of finer quality than was made in this country, and that is where we lost out with the foreign maker. But now some of the steel manufacturers are putting in good plants, and we will get even better steel than the foreign grade.

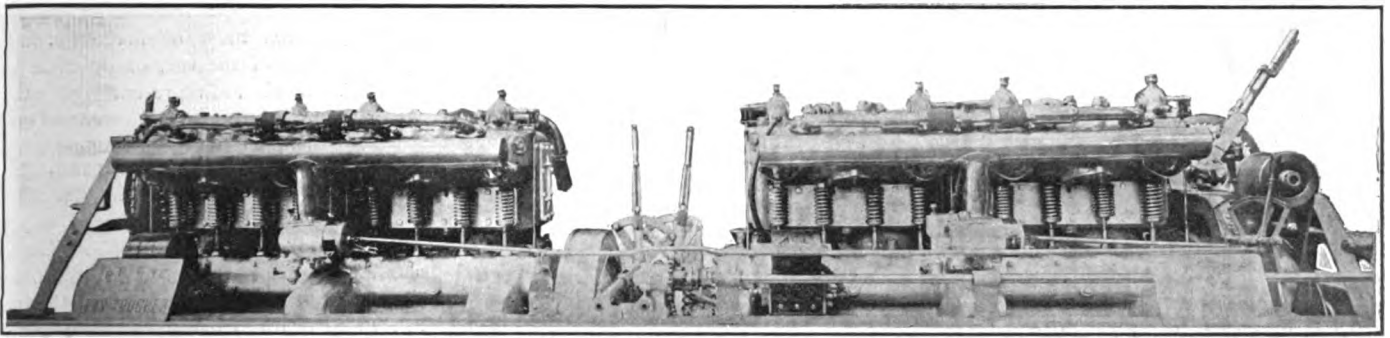
"The automobile has developed more during the past five years than any other manufactured article in the history of American enterprise. It will develop still further, as it is destined to be the main means of transportation.

"More than 95 per cent. of the commerce of the country is carried on wheels at present, and it will not be many years before the automobile surpasses all other rivals. The states are making better roads, and the day will come when the great trans-continental highways on which automobiles will be run will be the main means of communication between different cities.

France's Minister of Finance has offered two prizes, one of 20,000 francs and the other of 50,000 to the individual who shall discover, suggest or produce a denaturizing substance for alcohol, which will be superior to the agent at present employed, and which will entirely preserve the government from all possibility of fraud. The largest prize is to the individual who will discover means of employing alcohol for lighting purposes, in the same way, and with the same convenience, as paraffin is now used.



OUTLINE OF THE TARGO FLORIO COURSE.



SIDE VIEW OF THE "DUBONNET'S" 240-HORSEPOWER DE DIETRICH MOTOR EQUIPMENT.

The Motor Boat Innings Abroad.

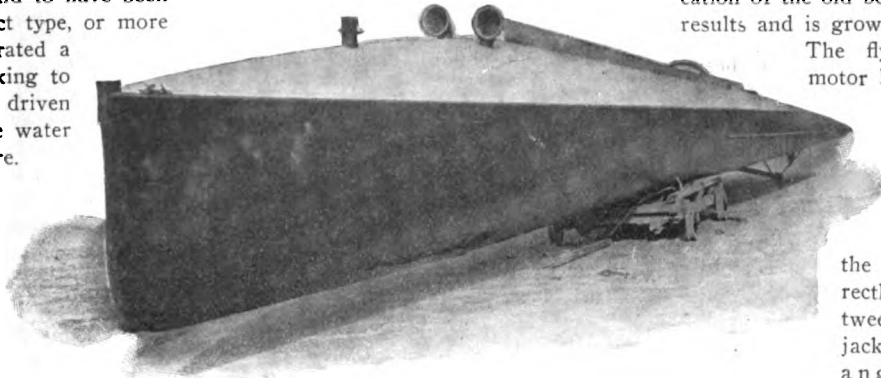
NICE, March 20.—Entries for the classic motor boat regatta to be held here the week of March 25-31 have closed and the craft entered represent all the great French and foreign boat builders. In the racer class the lines of nearly all the boats follow very generally upon those of the famous *Tréfle-à-Quatre*, which made such a good show in 1904, and which may be said to have been the forerunner of a distinct type, or more correctly to have demonstrated a principle to which all seeking to build hulls capable of being driven at great speed through the water have found it well to adhere.

Since last year constructors have earnestly sought means to strengthen and stiffen their hulls without diminishing speed, or sacrificing lightness. Many of the craft entered will, after Nice, take part in many river regattas, so that while the builders have spared no pains to strengthen their boats with a view to enabling them to keep the sea for a time, they will still have sufficient speed to afford them chances of victory in events on rivers and lakes.

De Dietrich 240-H.P. Auto Boat Motor.

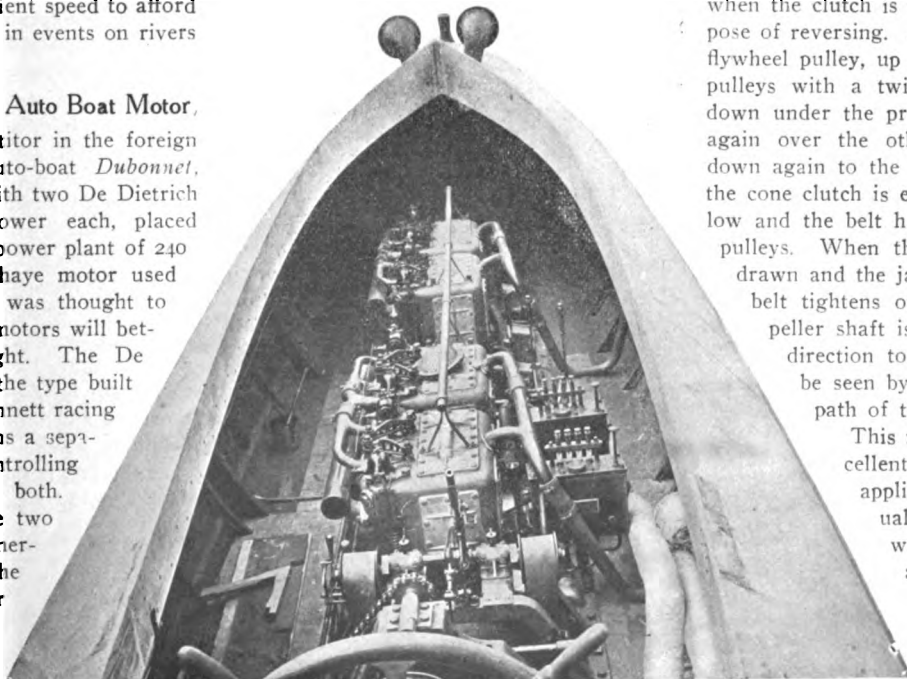
An interesting competitor in the foreign events will be the auto-boat *Dubonnet*, which has been fitted with two De Dietrich motors of 120 horsepower each, placed tandem, and forming a power plant of 240 horsepower. The Delahaye motor used in the boat last season was thought to be too heavy; the new motors will better distribute the weight. The De Dietrich motors are of the type built for the 1905 Gordon Bennett racing cars. Each engine forms a separate unit, but the controlling levers are common to both. Connection between the two motors consists of a leather-faced cone clutch of the usual type. Each motor can be started individually if desired or one may be started by hand and the

connecting clutch let in to start the other, though this must be done with care. The starting crank of the forward motor is seen in the extreme left of the engraving, showing a side view of the motor; a single chain is used to rotate the crankshaft, and room must be left forward of the motor for a man. The after engine is



THREE-QUARTER VIEW OF HULL FROM THE PORT SIDE FORWARD.

started from the rear end by a crank not shown in the same engraving, the longitudinal shaft and chain being shown, how-



BIRD'S EYE VIEW OF THE "DUBONNET" LOOKING FORWARD, SHOWING MOTORS IN POSITION.

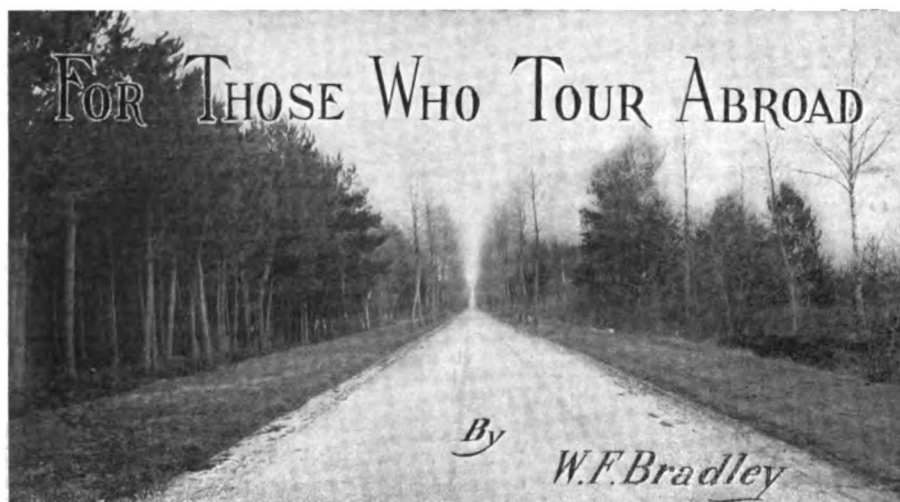
ever. The valves are all on the side and the piping is well arranged. Cylinders are cast in pairs with integral heads and valve chambers. The water jackets consist of skeletons cast integral with the cylinders and covered with flat-ribbed plates of aluminum. The camshaft slides longitudinally to give half compression when starting.

Probably the most interesting part of the power plant is the reversing gear, which, though it consists only of a modern application of the old belt drive, gives excellent results and is growing in favor in France.

The flywheel of the after motor has flanges, so that the rim of the wheel forms a pulley for a leather belt about 6 inches wide. A similar pulley is secured to the forward end of the propeller shaft. Directly over the space between the two pulleys is a jackshaft, placed at right angles to the propeller crank and crankshaft, on which are two loose jockey

pulleys. The jackshaft with its jockey pulleys is automatically lowered when the direct drive clutch is engaged and is raised when the clutch is withdrawn for the purpose of reversing. A belt passes under the flywheel pulley, up over one of the jockey pulleys with a twist of 90 degrees, then down under the propeller shaft pulley, up again over the other jockey pulley and down again to the flywheel pulley. When the cone clutch is engaged the jackshaft is low and the belt hangs clear of the large pulleys. When the cone clutch is withdrawn and the jackshaft raised until the belt tightens on the pulleys, the propeller shaft is driven in the opposite direction to the crankshaft, as will be seen by mentally following the path of the belt.

This reversing gear is an excellent one, as it naturally applies the power very gradually, is not subject to wear when not in use and is free from complications and from constantly moving parts which might cause trouble if neglected.



A TYPICAL FRENCH ROAD, LIKE WHICH THERE ARE MANY MILES.

PARIS, March 15.—The annual reports of several British railroads have revealed the fact that quietly, almost without the public being aware of it, a distinct change is taking place in passenger traffic. Without exception, on all the main lines in England, a serious falling off is recorded in the number of first-class travelers. It is not that the public travels less, or that the third-class compartment is preferred to the first, but that the rich classes prefer the automobile to the railroad.

In France, where there is proportionally a larger wealthy floating population, both native and foreign, than in the British Isles, the change is more noticeable, and the number of wealthy families who have neglected the iron way for the high road is largely on the increase. A visit to important garages in Paris during spring, seaside resorts during summer, and the Riviera centers of gayety during winter, affords ample illustration of the tendency of modern locomotion.

Among those who have done much to deprive the railway companies of receipts from first-class passenger traffic are American visitors to Europe. The contingents of tourists who every summer cross the Atlantic in ever-increasing numbers and spend two or three months "doing" Europe, realize that the only way to see a country thoroughly, intelligently, and enjoyably is by automobile. Up to recently this sport has been confined to multimillionaires, but with the development of enthusiasm for motoring among all classes in the United States, men of more modest means are beginning to consider a trip through Europe in an automobile.

Better to Use One's Own Car.

A crowd of questions present themselves to the automobilist who has taken the decision to travel through France and adjoining European countries. Shall he ship his own car across the Atlantic? Shall he buy a new one in France? Or, shall he hire one? The last-mentioned plan would be the most simple, but the one least likely

to be adopted by the true automobilist, for a hired car would entail a professional chauffeur and would rob the trip of the pleasure which is only to be obtained from driving and caring for a well-constructed machine.

A good second-hand car could be bought in Paris and sold to the broker after the trip; or, if the automobilist is desirous of purchasing a French machine, he could take delivery of his car in Paris, and, his European tour finished, take the vehicle back with him to America.

Supposing that the automobilist desirous of making a trip of from one to four months in France already possesses a reliable touring machine capable of carrying a party of four at a moderate speed, he cannot do better than bring it over for his tour. He will be put to some trouble at the commencement, but will be amply repaid in the pleasure to be derived from handling his own trusted car.

The First Customs Necessity.

If the automobile has been entirely constructed in America, there will be no customs formalities to go through on leaving the country. Supposing the car is of American make, but fitted with French tires, lamps, horns, or other accessories, a declaration must be made to the custom authorities in order that these articles may re-enter the country free of duty.

If the car is of foreign construction, additional care must be taken to have it declared in proper form in order to escape duty when returning. The broker who originally imported the car should be looked up and asked to make the necessary researches for an examination of the car by the custom house. He will have to furnish the name of steamer by which the automobile arrived, the date of arrival, the custom house invoice number, the date of entry, and the date duty was paid. The usual broker's fee for these duties is from \$5 to \$10. All information having been obtained, an application must be made to the customs au-

thorities for an examination of the car; this application must be made personally by the owner of the car, or by some person authorized to represent the owner under a deed of attorney.

To Ship Your Car Abroad.

So much depends on careful packing of the automobile, this work should only be entrusted to experienced people. The car should be suspended in a strong waterproof case, the cost of which will be from \$75 to \$100 for a large car, and slightly more costly for an extra large vehicle.

The automobilist would save himself considerable trouble by placing the matter in the hands of some transport agent making a specialty of shipping automobiles.

From the American Express Company, 65 Broadway, New York, a firm with considerable experience in this branch of shipping, the following quotation has been obtained:

From New York to Paris the cost of shipping an automobile varies from \$90 to \$250, according to the steamer and weight and size of car.

Packing in New York varies from \$60 to \$100. In Paris the charge is from \$25 to \$55.

The Compagnie Générale Transatlantique, running between New York and Havre, often refuse to carry automobiles on their crack liners, shipping them only on cargo boats, of which there is a regular service about three times a month. Inquiries as to the transport of the car should therefore be made a little time in advance, so as to avoid landing in Europe and having to wait an unnecessary length of time for the car to arrive.

When You Enter France.

On entering France, customs duties must be paid on the automobile, but this amount will be refunded on leaving the country within twelve months.

It should be particularly noted that this permission always dates from January 1 to December 31, and not from the actual date of entry.

Representations are at present being made by the Automobile Club of France and the Touring Club of France towards the customs authorities with a view to obtaining twelve clear months. The amount of the tax is \$12 per 100 kilos (220 pounds); thus, for a car weighing 1,000 kilos, \$120 would have to be deposited.

Should the traveler leave the country for a short time, he should allow the money to remain on deposit with the custom authorities, and only ask for its return when definitely leaving France. Before passing over the frontier, however, his customs receipt should be indorsed.

Entering Other European Countries.

On passing into adjoining European countries—Italy, Switzerland, Belgium, Germany—the same formalities will have to be gone through as on entering France. In

Belgium, the tariff is 12 per cent. of the declared value of the car; in Switzerland, \$4 per 220 pounds; in Italy, \$40 up to 1,100 pounds, \$80 from 1,100 to 2,200 pounds, and above this weight, \$120.

In all cases the car must enter these countries by road, accompanied by the owner; if sent over the frontier by rail, full duty would have to be paid and would not be returned.

On entering Italy a certificate must be produced declaring the exact weight of the car.

Registering and Obtaining Certificate.

The French regulations require that every automobile should be registered at the offices of the "Prefect of a département," or, in Paris, with the Prefect of Police (Préfecture de Police, Paris).

The declaration must be made on paper bearing a 60 centime stamp (12 cents) and be accompanied by the full name and address of the owner, the name of the constructor, and the number of the motor. A receipt (a gray card) bearing the registered number of the car will be given, and this number must be carried in white letters on a black ground, both in front and at the rear of the car.

To obtain a driving certificate a demand must also be made to the Prefect of the Department, or the Prefect of Police in Paris, on stamped paper (*papier timbré*) of 60 centimes value, to be obtained at any post-office. The name and address of the applicant are required, his address in France, three unmounted photographs, and some papers to prove his identity (a birth certificate, or a certificate from the American consul is generally asked for).

The applicant will probably be called upon to undergo a driving examination before the inspector of the Service des Mines, and, having satisfied that official of his ability to drive an automobile, will be granted a red card available throughout France. If a short visit is made to an adjoining country, the French certificate and registration number may be used, but should a lengthy stay be contemplated, the tourist should immediately conform to the regulations of the country.

In all these matters the American visitor must be prepared for a large amount of red tape. It is advisable, therefore, to come furnished with all necessary papers in order to avoid vexatious delays. Once, however the customs house passed, the car registered, and the driving certificate obtained, there will be nothing to mar a trip through France, and the visitor will certainly return home with pleasant recollections of good roads, reasonable police regulations, fine scenery, and novel, historic, and interesting surroundings which will remain in memory for many a day.

In returning to America it is advisable to hand all papers connected with the passage of the automobile through the customs house to the broker who attended to the matter in the first instance. The cost will

be but trifling, and much trouble will be saved the traveler.

Should alterations have been made to the automobile during its absence, duty will have to be paid on the value of the work done. A broken part replaced or any minor repair which is not at all noticeable would pass through free of duty; but should a new body have been fitted, a new ignition system adopted, or any improvements of an important nature have been made, duty would have to be paid according to their value. Travelers have on several occasions contested the right of the customs authorities to enact duty on repairs, but when the matter has come before the courts have always lost their case.

How to Hire a Car in Paris.

There are in Paris several firms hiring out automobiles for long or short distances, and the visitor who prefers to take a hired machine rather than bring over his own vehicle or buy a new one, will always find first-class cars of the latest model capable of going anywhere.

These cars are, as a rule, not let out except under the charge of the firm's own chauffeurs, even if the hirer is a skilled driver. Of course, arrangements can often be made with the chauffeur for him to give up the steering wheel to the traveler, but such an arrangement is not recognized by the owner of the car, and the professional chauffeur would be held responsible for all accidents or mishaps which might happen to the automobile.

A few firms are to be found who are not so strict in this matter, and would allow an automobile to start on a tour without a chauffeur if they were fully covered against accidents to the car. Often these conditions are so onerous as to amount practically to buying the car, which, by the way, can always be done, the dealer agreeing to buy back the car at the end of the tour at a price to be agreed upon according to its condition.

At the Bob Walter garage, 83 Avenue de

la Grande Armée, THE AUTOMOBILE correspondent was shown a number of handsome cars of different makers used exclusively for long and short tours through France, their occupants generally being American visitors. At the beginning of the year they are principally employed on runs to the Riviera; in the spring they are often found in Touraine, and, as the Summer advances, they leave the capital on journeys extending from one to four months. The price varies considerably, according to the size of the car and the journey undertaken, but may be quoted at \$20 a day for a medium-sized car.

A handsome, roomy touring car, Panhard, Renault, Mercedes, or other well-known make, with side entrance and cape hood, could be obtained for a long journey at the rate of \$1,000 a month, including all charges except gasoline, garage charges, and board and lodging of the chauffeur.

The Société Ader, 40 bis Avenue de Suffren, Paris, gives the following tariff for the hire of automobiles:

	2-cyl.	4-cyl.
Half day of 6 hours.....	\$15	\$17
Day of 10 hours.....	25	30
Seven days	170	180
Two weeks	270	300
Four weeks	360	400

For service in Paris these charges are inclusive. If on a tour, the hirer must pay for gasoline, garage, and board and lodging of chauffeur. The standard type of car used by the Ader company for town service has a four-cylinder motor, with drive through countershaft and side chains, and carries a landaulet body. For long-distance touring, double-phaeton, side-entrance bodies, with folding hood or tonneau bodies are also supplied.

The chauffeur is in uniform, and the cars, which are built by the Ader company, have a smart and well-finished appearance.

The Price of Gasoline.

The price of gasoline throughout France varies from 60 to 70 centimes (12 to 14



IN THE PYRENEES DISTRICT, WHERE THE SCENERY BECOMES RUGGED AND PICTURESQUE.



A FRENCH ROAD BEING USED FOR STRAIGHTAWAY COMPETITION.

cents) in Paris, to 30 or 32 centimes (6 cents) in the country. Except in Paris, one need never pay more than 8 cents.

In some cases a contract is made with the chauffeur to supply all fuel required for the tour and provide his own food and lodging. The traveler must, of course, know the entire distance he intends to cover and how many miles he will travel a day. This frees the hirer from all trouble of paying for fuel on every occasion and gives the chauffeur more liberty, for instead of taking his meals at the same hotel as the travelers he will patronize much cheaper establishments and thus save a little money for himself without robbing anyone.

Insurance charges are always covered by the owner of the car for France only, the hirer paying insurance while in other European countries. The Ader company insures against accidents for \$6,000 and \$2,000 for each person injured, the responsibility of the company being limited to this sum.

Join the Touring Club de France.

Persons who intend spending any length of time in Europe would be well advised to enroll themselves as members of the Touring Club de France, the headquarters of which are at 65 Avenue de la Grande Armée, Paris. Entrance is obtained on payment of an annual fee of \$1, and on the proposition of two members of the Touring Club.

The American Automobile Association not long since consummated an arrangement whereby a member of any one of its clubs or an individual member could upon presentation of his A. A. A. card at 65 Avenue de la Grand Armée obtain immediate membership in the Touring Club; or a mailed application, also accompanied by the A. A. A. card, would receive prompt attention and be sent to any address supplied. A. A. A. membership thus makes unnecessary the indorsement of two Touring Club members and also removes the customary fortnight of delay in awaiting T. C. F. action on the application.

In addition to guide maps, advice on routes, lists of recommended hotels, with a reduction of 10 per cent., the Touring Club is authorized to grant free permits into foreign countries. Instead of paying the cus-

toms duties in the usual way, members may deposit the amount with the Touring Club de France, and will receive a certificate allowing them to enter and leave a foreign country any number of times during the year. The particulars required when applying for a foreign permit, known as a tryptique, are name, address, and membership number, make and description of car, name of maker, number of the motor, kind of tires, value, and weight of automobile.

When One Crosses to England.

As many automobilists finish up a trip in France with a run through the British Isles, some figures as to the cost of crossing the Channel may be useful. There are three main routes from France to England:

Boulogne to Folkestone, the shorter sea passage, but the most expensive route, the rate for an automobile, unpacked, being \$25, owner's risk, and \$37.62, company's risk.

From Dieppe to Newhaven, a four-hour sea journey, the rate is \$22.50 at owner's risk, and \$30.25 at company's risk, plus \$1 per ton.

From Granville, St. Malo, Cherbourg, Honfleur, or Havre to Southampton, sea journey eight to ten hours, the rate is not exceeding one ton, \$11.86; not exceeding one and a half tons, \$17.69, and not exceeding two tons, \$23.72.

Automobiles must be at Havre at 4.30 P. M., and for all these services it is

necessary to reserve space on the steamer the previous day and at the same time advise the company of the weight of the automobile, extreme length, width, and mention if the car is fitted with a canopy or limousine body. Gasoline tank must be emptied before going on board. Between Havre and Southampton there is a daily service, but between other French ports and Southampton boats only run two or three times a week.

A. A. A. members, on reaching London, and calling at the headquarters of the Automobile Club of Great Britain and Ireland, 119 Piccadilly, W., upon presentation of membership tickets to secretary J. W. Orde, will receive international courtesies, there being an understanding between the A. A. A. and the A. C. G. B. I.

New French Regulations.

PARIS, March 9.—New French automobile regulations have been under official consideration for several months and may be expected to be issued in a short time. They will contain several important modifications of the 1899 and 1901 laws. Instead of the inspector having to assure himself solely of the candidate's ability to drive, under the new régime he will demand a medical certificate, proving that the future chauffeur has no disease likely to hinder him as a driver.

Two certificates will be granted, one for cars running at less than thirty-five kilometers an hour and another for vehicles capable of traveling at a higher speed. (Curious anomaly, the French speed limit is thirty kilometers an hour in the open country.)

In order to prevent the issue of a low-grade certificate for a high-power machine, each chassis must carry a plaque easily visible, on which shall be given the name and address of the builder, power, series and number of the motor. Except for electric cars, two numbers must be carried, one in front and one in the rear, which shall designate not the car, as at present, but the actual proprietor.



ENTERING VIBRAYE, A FRENCH VILLAGE ON THE SARTHE CIRCUIT.

GAS TURBINES DISCUSSED BY DUGALD CLERK.

AMONG the problems which engage the attention of the inventor in the automobile field, one of the most attractive, if we may judge from many communications received on the subject, is that of the substitution of the gas turbine for the reciprocating engine as the prime mover. In the past the subject has been discussed occasionally in these pages, and we now publish one of the most valuable contributions on the subject originally from the pen of the great English engineer, Dugald Clerk, and which was presented to the notice of the engineering profession in an address delivered before the English Junior Institution of Engineers.

The great success that has been attained in the introduction of the steam turbine for stationary power purposes and in steamships has undoubtedly been largely responsible for the interest of inventors in the problem of the gas turbine. In the direction of simplification and especially of avoidance of the stresses and vibrations caused by the reciprocating masses in the ordinary form of motor, the problem seems worth while, but there are apparently certain insurmountable difficulties in the way especially for automobile propulsion in which the question of weight is of prime importance. In his opening remarks Mr. Clerk states that he has only known one instance in which a gas turbine "really rotated," and in this instance the brake horsepower was infinitesimal. The experiment was conducted by F. W. Lanchester, the automobile engineer, who in originality and freedom from the prejudice of convention is the English equivalent of our own Charles Duryea. The machine made a great noise, not an infrequent accompaniment of an inventor's pet scheme, and did practically nothing else.

Mr. Clerk has reached the conclusion that the practical difficulties in the way of the development of the gas turbine are insurmountable—especially those occasioned by the high temperatures employed. In his address he refers to the writings of R. M. Neilson and Dr. Charles E. Lucke (Columbia University) and Prof. Sidney A. Reeve on the subject and continues:

"In most of the recent discussions upon gas turbine problems it has been recognized that the temperatures possible in the cylinder gas engine are impossible for the gas turbine. It has been fully proved by many investigators, including myself, that the temperatures quite common in ordinary gas engine practice range as high as 2,000 degrees Centigrade, although in the best practice, for most economical results, 1,500 degrees Centigrade or 1,600 degrees Centigrade appears to be an upper limit. With

the temperature of 1,500 degrees Centigrade or 1,600 degrees Centigrade, a first-class modern gas engine of about 50 horsepower will give an indicated efficiency of 35 per cent. At the same time, the negative work of the cycle is so low that the mechanical efficiency of the engine may be as high as 86 per cent., or even over. If one realizes what the temperature 2,000 degrees Centigrade means, it becomes very evident that no turbine constructed either on the lines of Parsons or Laval could possibly be made to work with continuous supply of such gases; 2,000 degrees Centigrade is considerably over the melting point of platinum. It is much higher than the temperature at which cast-iron flows from the crucible, or, indeed, the temperature of the interior of the blast furnace itself. Any blades of iron, steel, or, in fact, of any other material—even brick-fire itself—becomes fluid or semi-fluid at this temperature. It is obviously hopeless, therefore, to attempt, in the gas turbine, temperatures which are quite feasible in the cylinder engine. This fact, as I have said, is generally recognized.

It is accordingly said, by those who take a favorable view of the gas turbine, that it is necessary to supply the turbine with gases at a much lower temperature. Mr. Neilson fixes the temperature of 700 degrees Centigrade as one which steel turbine blades would probably stand, without too rapid deterioration. I fear that on this point I must differ from him, because in my experience, oxidation of steel, and even iron, is a fairly rapid process at this temperature. Nothing new has been proposed as to the thermodynamic cycle of the gas turbine, so that all reasoning upon efficiencies depends upon the deductions already made from internal combustion engine practice.

"Seeing the impossibility of constructing a turbine with materials to stand a high temperature, many have proposed to convert high temperature into kinetic energy, so that instead of having work stored up in the gas in the form of heat, the heat shall disappear, and the energy of the heat be transformed into motion of the gaseous particles at a high velocity. Such proposals, then, include the compressing of a gaseous mixture to, say, 50 pounds or 60 pounds above atmosphere, the igniting of that mixture within a combustion chamber at constant pressure, and the expansion of the mixture through an expanding jet of the Laval type, so as to drop the temperature and obtain its equivalent in kinetic energy or velocity of the gaseous particles. The rapidly moving particles at the relatively low pressure and temperature are then allowed to impinge upon rapidly rotating blades of sickle configuration, and they are supposed to give up

their energy of motion to those blades, and so expend work upon the turbine. This appears to be the most feasible of all the gas turbine proposals, so I will proceed to examine it a little more minutely.

"Success by this cycle of operations requires:

"(1) A rotary or turbine compressor of high relative efficiency.

"(2) An expanding nozzle which shall ensure that free expansion is quantitatively equivalent to adiabatic expansion behind a piston.

"(3) A rotating turbine of such construction as to secure very high efficiency of transformation of kinetic energy of the moving gas into effective work available at the turbine shaft.

"Assuming air to be the working fluid, and specific heat to be constant through the temperature range, it is easy to calculate the efficiency of the Joule or Brayton cycle, which these operations in effect represent. It would be useless to attempt to work a turbine at a pressure so low as to be relatively inefficient compared with the gas engine, so I have chosen a Joule cycle of, say 48 per cent. ideal efficiency, which in a cylinder gas engine would probably give, in practice, about 30 per cent. indicated efficiency. For this ideal efficiency the pressure of compression would require to be 141 pounds per square inch absolute. To give power with a reasonably small pump, I shall assume a maximum temperature of 1,700 degrees Centigrade. That is, assuming a perfect compressor and a perfect nozzle expander, the temperature would only fall from 1,700 degrees Centigrade to 750 degrees Centigrade. Plainly, this temperature would be too high for a Laval disk with blades. In order to get a reasonable temperature on expansion, it would be necessary to assume a maximum temperature in the combustion chamber no higher than 1,000 degrees, and this would bring down the temperature, after complete expansion, to about 500 degrees, which, no doubt, steel turbine blades can be expected to stand for some considerable time.

"With these assumptions, however, the gas turbine would not be very economical, as compared with cylinder engines, even assuming all difficulties overcome. The theoretical and practical difficulties, however, are very serious indeed.

"To begin with the question of an efficient air compressor. I am not aware of any turbine compressor capable of compressing up to 140 pounds absolute from atmosphere with anything like 60 per cent. efficiency. Before success could be attained, this efficiency of compression, so far as diagram is concerned, should be at least 90 per cent., in order to

allow for unavoidable mechanical and other losses in the subsequent processes. It has, it is true, been proposed to substitute cylinder compressors operated from the turbine, instead of turbine compressors; but this, it appears to me, would be equivalent to abandoning at once all the advantages of the turbine principle. If reciprocating cylinders are to be used for compression there is no objection to using them also for expanding. No gas turbine with cylinder compressors could, in my view, succeed. Assuming, however, even 90 per cent. efficiency from a turbine compressor, and assuming that we have a compressed gaseous mixture burning freely in the combustion chamber at the desired pressure and temperature we have yet to face the problem of the expanding nozzle. It is always assumed that with the use of an expanding nozzle temperature drop can be as certainly attained as with an expanding piston in a cylinder. This, it seems to me, has been by no means proved.

"You will all recollect Dr. Joule's famous experiment with two vessels immersed in water and connected together by a pipe having a stop-cock upon it. All was compressed into one of those vessels, the water round the vessel stirred, and equilibrium obtained, while the other vessel was rendered as vacuous as possible. The stop-cock between the two vessels was opened, and it was then found that when the water was stirred again, no disturbance of the equilibrium ensued. This, of course, meant that although heat was lost in the one vessel, giving velocity to the gases, it was gained in the other vessel by the impact of the gases against the walls.

"Joule modified this experiment by placing the two air vessels in separate water containers. He then found that the temperature of the one vessel dropped, due to expansion, but the temperature of the other vessel rose as much as the first dropped.

"Now apply this experiment to reasoning on the behavior of the flame in an expanding nozzle. Assume the two vessels to be connected together by a Laval nozzle, and assume that while in the nozzle the gases experienced the full temperature fall due to adiabatic expansion. Immediately, however, on contact with the walls of the second vessel the velocity of the particles would be stopped and the temperature would be restored to a point somewhat above the original temperature; that is, the mass of expanding flame in the pressure vessel would gain heat by the amount the first vessel lost. That is the result of the final process. It will be easily recognized that to obtain a sufficient temperature drop in an expanding nozzle necessitates the practical absence of turbulent motion of every kind; that is, to expand adiabatically the jet must be so constructed that there is an absolutely smooth flow from high pressure to low, and no impact or loss of velocity from any cause whatever. So far as I understand expanding

jets, no adiabatic expansion so perfect as this has ever been obtained.

Assume, however, that the efficiency of expansion in such a jet is, say, 90 per cent. We now come to the question of the efficiency of conversion by the turbine blades. In many calculations from diagrams, it is assumed that the efficiency of conversion of motion into work is practically perfect. This, however, is by no means the case in present turbines. Even the steam turbine, high as its efficiency is, compared with the reciprocating engine, has no very high efficiency of conversion in any of the forms of turbine at present on the market. That is, if we assume a mass of gas to exist in a compressed state in a reservoir, and we choose to expand this mass of gas in two ways, for the sake of comparison—(1) behind a piston; and (2) by means of a Laval jet and turbine, we shall find that the efficiency of conversion of the turbine, once high velocity is attained, does not exceed 80 per cent. In this respect the efficiency of conversion of rotating turbine blades is inferior to that of a moving piston in a cylinder. The reason of this is obvious. It is impossible to so arrange the impact of a rapidly moving gas with a turbine blade or blades in such manner as to entirely avoid turbulent motion. The impact, for example, of swiftly moving gases on a fixed surface results ultimately entirely in turbulent motion, which restores to the gas or to the blade struck all the heat which has disappeared in temperature fall due to adiabatic expansion.

(To be continued.)

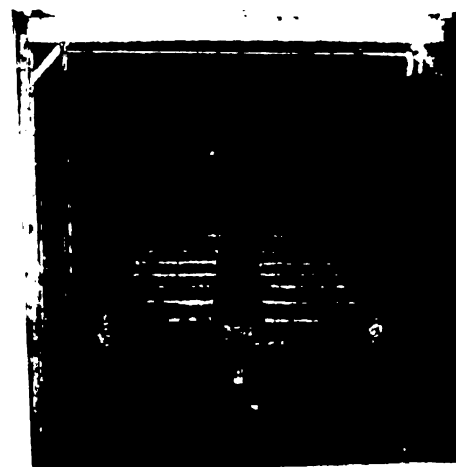
An Imitation 'Bus Trip.

The sight-seeing 'bus has found generous use in many cities throughout the country, and thousands have enjoyed observation rides in a manner not otherwise possible. Now comes a reproduction of the big juggernauts, constructed in such a manner in connection with a moving picture entertainment that one is easily led to imagine he is actually enjoying the real ride itself. Tim Hurst, the well-known baseball umpire and a referee of glove contests and wrestling matches, is the discerning man who figured out that since the "rubber-neck" coaches were so popular people would patronize a substitute that could be had at a lesser price. Living at the Hotel Bartholdi in New York City, one of the starting spots of the sight-seeing caravan, Mr. Hurst got the idea from a daily observation of the departure of these big pleasure wagons.

After one has gotten seated in the "prop" 'bus, the lights are properly arranged, and the journey begins to the accompaniment of horn tooting, the starting of the motor, and the oscillating motion exactly as one would experience it from the top of a real vehicle. The imitation car is suspended in such a manner as to make the effect very realistic. Apparently the vehicle is forcing its way through the labyrinth of traffic,

with occasional stops at crossings, pedestrians dodge to the right and left, and the lecturer recites the objects of interest along the route. New York City requires a film of 840 feet, and the route starts at the Flatiron building, covers Fifth avenue, crosses to Riverside Drive, returns down Broadway, invades the East Side, and crosses the Brooklyn Bridge. Another film, 800 feet long, pictures Washington in like manner. Mr. Hurst is placing his "auto tours" in a score of cities throughout the country, and Dreamland, Coney Island, will also possess one.

The letters patent which have been granted the "Timothy C. Hurst Amusement Device" relate to and cover a new amusement device, the body of which may be made to represent an automobile touring car, or any vehicle adapted to carry passengers, and is suspended above the floor in order that suitable vibratory mechanism may be incorporated therewith for the purpose of impart-



AS THE CAR LOOKS FROM THE FRONT.

ing a vibration similar to that produced in a running vehicle when in motion. An oscillating device is also installed for the purpose of producing the effect of traversing pictured curves either to the right or left, or passing over uneven surfaces.

The accepted style of tourist car with elevated seats rising one above the other toward the rear of the car is used and swinging steps at the rear admit the passengers. At the front of the car the mechanism is located which controls the motion, and which is under the care of an operator. After the car has been filled with passengers the operator closes the circuit by a turn of the switch handle, starts the motor, which is connected to a balance wheel by means of a belt, and keeps the same under his control at all times.

The device is intended for use in connection with moving pictures, the scenes being placed in front. The realistic effect is produced by the vibratory movement of the car, controlled by its mechanism working in union with the moving pictures or scenes.

Trend of French Practice in Construction.

Conclusions Drawn from Tendencies Observed at the Paris Salon—Finality of Design Still in the Future.

By RENE M. PETARD.

PARIS, March 7.—Under different headings a general survey has been made, in preceding letters, of the most important features of the best known makes of machines exhibited at the Paris show, and also of the main constructional points in a number of other makes, thus giving the reader an abstract of the various ways in which designers conceived the different parts of their machines. Drawing conclusions from these articles and from what the space reserved for them unfortunately barred out may be a difficult proposition, as it hardly can be done without being, perhaps, a little prejudiced in some direction by one's own ideas and experience. As it might, however, prove useful if not interesting, the feat will be attempted, with the greatest possible care to be strictly impartial.

A few points which have come under discussion periodically ever since the automobile evolved itself to approximately its present types, without ever receiving a satisfactory solution, with the result that, even now, no expression of a tendency can be given, will be left out of this study. Prominent among these is the propeller shaft vs. chain drive discussion.

It is evident that in a mechanical product susceptible of such widely varying applications as the modern automobile, there cannot be any hard and fast rule to be universally applied to all the forms the machine may take. Consequently in dealing with such a subject as this care should be taken by the reader not to be misled by generalizing too much from anything that may be said concerning one particular type of machine, as the most erroneous conceptions might result.

TWO CLASSES OF PLEASURE CARS.

In the pleasure car line we find in Europe (as well as elsewhere) two classes of machines, the dividing line between which is becoming more and more distinct as the time goes on; namely, the class formed by those machines which are built solely and exclusively with a view to luxury and style, irrespective of cost, so that they may reasonably be expected to contain the finest engineering developments suggested by the experience of the past; and the other class, which is formed by machines developing simultaneously with the former but on simpler lines, as they are intended for more practical purposes and for a class of buyers for which the cost of upkeep and the original expenditure in the purchase of the vehicle are important considerations.

In the former class we find the school where designers learn the perfectable and

the good points of their conceptions, and test them in their first, and consequently more complicated form, until they have brought them down to greater simplicity and equal, if not greater efficiency, when they can be used to further increase the quality of the cars of the second class. Thus, for the particular end aimed at in this article, the highest class of cars will be most extensively treated, although in the ordinary course of things, the other class, which represents a great majority, should have been given pre-eminence.

In the class which we termed "the first" are to be found racing cars, which properly are the school of automobile design, and the high-powered touring cars which are generally directly evolved from the racing machines. Not considering the freaks, which too often supply arguments to the adversaries of racing, and those catalogue high-speed touring cars belonging to this class only by the size of their cylinders, which too often are too big for the designer's abilities, we find that for 1906 great progress has been made along lines which could well be foreseen a year back, and yet which open new prospects for further development toward the ideal type of machine the general conception of which is every day becoming easier to realize.

DEVELOPMENT OF HIGH-SPEED ENGINES.

The engine, naturally, is the most perfectable part of these machines, since it is, with the clutch, that which varies the most in its conception. The undoubted tendency in this respect is toward bringing the engine as near as possible to a rotary motor by lessening, to the greatest possible extent, the defects essentially belonging to the reciprocating motion. Evidently the practical rotary explosion motor or the turbine are things probably of the far future, but nevertheless, the tendency is to so make our reciprocating motors now that they will hardly be known to possess reciprocating parts.

This end is likely to be attained by increasing the number of reciprocating units and decreasing their weight so that their respective motions overlap each other in such a way that any given motion will be continuously produced by its succession in the different elements of the motor. This has been obtained in the four-cylinder motor, which undoubtedly has now come to stay, as it is the most practical form of engine, taking cost price into consideration. In this engine, however, although any given motion of the piston or parts is being constantly produced, this motion constantly varies in intensity, being maxi-

mum and nil at each stroke for extremely short periods of time.

In order to reduce the duration of these periods it was necessary to increase the speed of the motor, thus obtaining a greater number of reciprocations in a given time, so that they became more confused and consequently less felt, having less time to impart their motion to other parts. This has resulted in the construction of motors of the highest power in automobiles which normally revolve at speeds considered fatal a few years ago, even for the fastest of the medium-powered engines.

MULTIPLICATION OF CYLINDERS.

Other designers preferred to multiply the number of irregular periods not by increasing the speed, but by increasing the number of cylinders; this has resulted in the materializing of long-thought-of six-cylinder motors, or even of such excellent machines as the eight-cylinder English Rolls-Royce engine, and the Darracq racer used in Florida and Cuba. That these will become the standard types of engines is to be doubted, however, as their complication becomes almost commercially prohibitive; but it should be considered that the six-cylinder engine may have a chance for the machines classed among the high priced ones. Besides increasing the regularity of the torque, the multiplication of the number of cylinders, or of the impulses per cylinder, has perhaps the more important advantage of the increase in flexibility of the motor.

CLASH GEARS TO DISAPPEAR.

It is now generally considered by all our best designers that in the car of the future there will not be anything like the change-speed gears which we use, or have used in different forms in the past, as all these have always been most unmechanical devices which must of need disappear eventually. To permit this, a flexible engine, and one that will preserve its power at different speeds, just as does a steam engine, will naturally be required, and that is what every one is striving to produce. The means mentioned above have been steps in that direction, which, added to the improvements in valve and cam design, have permitted us now to obtain engines giving a power strictly in proportion to speed between very wide limits.

This is, however, not sufficient to do away with all gearing, as several experimental machines have shown of late. To obtain the required engine, that is, one giving a constant power at different speeds and possibly developing occasionally, a power above normal, various experiments have been tried, among them the Mercedes compound engine, all of which have, unfortunately, given unsatisfactory results, although we must expect to see the problem solved in the future.

PROBABLE CLUTCH CHANGES.

To assist the engine in this direction by artificially giving its drive an elasticity which it does not possess to a sufficient

extent now, great attention has been devoted to the clutches. As a result, these have become less liable to disturbance, being all metal, and also more gradual and gentle in their action, and will become still more so as the time goes on, so that we must expect the coming automobile, if it follows the rational and relatively slow evolution which it is undergoing at present, to become the combination of two main elements. These are an ideally flexible engine supplemented by a smooth clutch, perhaps of the hydraulic type, but more probably on the metal-to-metal system. Possibly the perfect engine may eventually not require any clutch at all, but this, apparently, is not possible in our present state of knowledge. Besides these two principal elements there will be only a suitable mechanism to transmit the power direct to the wheels, perhaps avoiding in a mechanical and efficient way the use of the bevel gears which are presently one of our necessary evils.

DIVISION OF THE STRESSES.

Passing to details, an evident tendency in all classes of automobiles is to divide the stresses, whatever their nature, between the greatest possible number of parts, without, however, unduly increasing the complication of the machine, and to make and dispose every part so that it will have as few different stresses as possible to take care of.

In the machine of the future, the whole will apparently be so built that the independence of its different components will be such that no distortion or unexpected motion of the machine or of one of its parts can affect another portion of the mechanism, thus giving the car that elasticity which means strength and durability.

These two main points—elasticity and steady power with a flexible engine—are the two qualities which are to be found every year to a greater extent in all machines, and they are certainly those which will be the characteristics of the definitive automobile, if a mechanism can ever reach a definitive form.

Other well evident tendencies are toward automatic appliances, performing without the need of any attention the most important functions hitherto left to the care of the driver. Among these are especially lubrication and alteration of all the feeding and igniting conditions of the motor, according to the variations of the throttle opening.

APPLICATION TO MODERATE PRICED CARS.

In the lower priced cars we find that all the improvements found suitable for the highest grade of machines are conservatively taken up as soon as they can be fitted in a simple and effective enough way to produce a better article without making its price prohibitive; thus, in that direction four-cylinder engines are steadily growing in favor. These engines, too, are now often fitted with the most improved devices and fulfill all requirements of

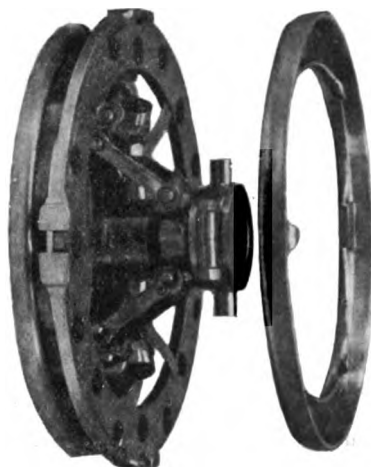
quietness, flexibility, and reliability. New clutches are worked out which are simpler than those originally found on expensive cars and are equally efficient; in short, these cars, as before stated, exemplify the useful application of the studies made upon the highest priced machines, but in a businesslike and inexpensive way.

In the commercial vehicle line no expression of a tendency can yet safely be proposed, as the designs of these machines are so widely different that the only thing that could be said concerning the future is an expression of the huge and growing demand there is for these vehicles, yet this cannot be considered a matter to be treated here.

In closing it should be added that, save for some of those machines which always appear to be made by men wanting to revolutionize the whole world in one day, there is a growing tendency toward an eventual, and at present involuntary unification of design, being a proof of a steady and healthy development of the industry.

Cork Inserts for Clutches.

The idea of using cork for producing friction between the members of a clutch, or between the drum and the band of a brake, seems at first thought anything but practicable, when the hard work to which



AUTOCAR CLUTCH WITH CORK INSERTS.

these parts are subjected is considered. Cork is nevertheless used for such work, and is said to give excellent results. The manner of using cork is to form recesses in one of the friction surfaces and fill these recesses with cork under pressure, smoothing down the inserts until their surfaces are practically level with the metal. The accompanying illustration shows a three-plate disk clutch with cork inserts in the central plate.

Patents covering the cork insert system are controlled by the National Brake & Clutch Company, of 16 State street, Boston. This concern does not manufacture clutches or brakes, but aims to induce manufacturers to adopt the cork insert or "Compo"

system under license. The owners of the patents state that the friction set up by the cork inserts is very great, while there is no tendency to seize or grip. While no attempt is made to explain the action of the cork, it is stated that dirt, oil, and the like, which would tend to keep the friction surfaces out of contact, are gathered up by the corks and thus the metal surfaces are brought into intimate contact. It is said that the compressed cork will not become soaked with water or oil and thus lose part of its frictional efficiency. The cork inserts wear no faster than the surface of the metal in which they are embedded. Manufactured cork—that is, cork ground up and compressed with a binder to keep it together—cannot be used, as it would soon disintegrate. Natural cork of a good quality, however, is said to have a remarkably long life when used for this work.

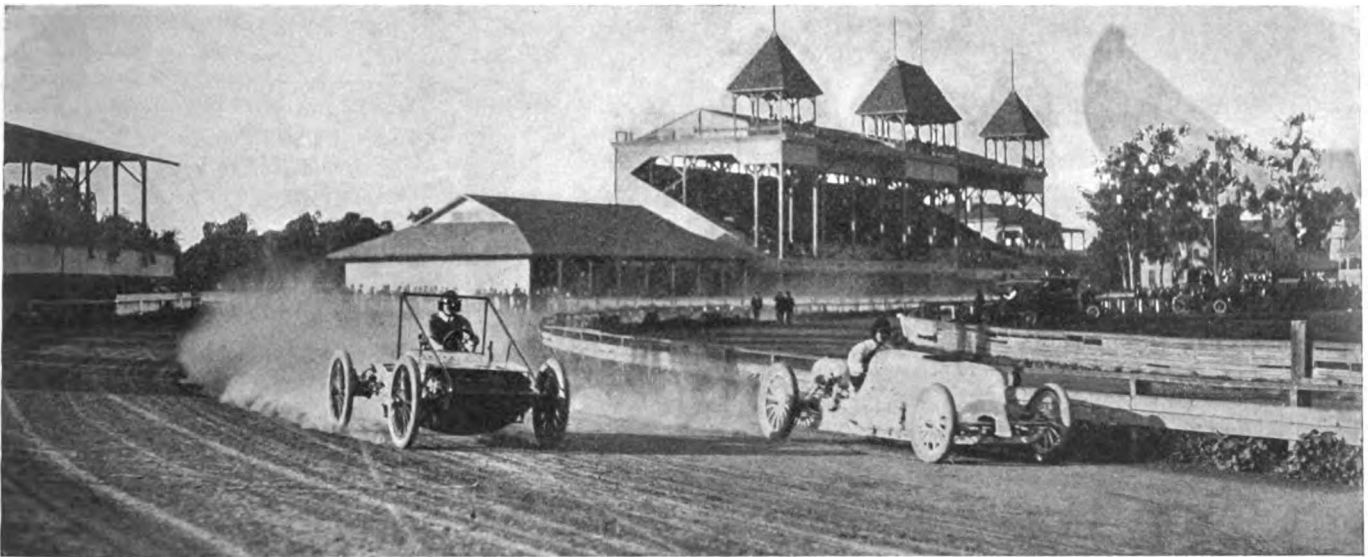
The cork insert system has been used for some time in loom clutches, in mill pulleys and clutches, hoisting engine frictions, and railway brake-shoes, and the patentees state that in all cases the results have been excellent. In the automobile field a number of cars have been experimentally fitted with clutches and brakes with cork inserts, and the Autocar Company, of Ardmore, Pa., regularly uses cork inserts in its clutches. The clutch illustrated is the one used in the Autocar, and it is stated that two thousand cars have been fitted with this clutch.

One of the claims made for the cork insert clutch is that it will hold much more efficiently than a clutch without corks, spring tensions being equal; or that the same holding efficiency can be obtained with a lighter spring. This is, of course, an advantage, especially in cars where much manipulation of the clutch is necessary. A stiff spring is apt to cause considerable fatigue of the foot and leg.

The National Brake & Clutch Company expresses its willingness to permit individuals to equip one clutch or one set of brakes with cork inserts for trial, provided application for permission is made in writing.

OPPOSED TO COACHMAN DRIVERS.

Entrance of coachmen into the ranks of chauffeurs is proposed by the National Professional Chauffeurs' Club, which last week issued a statement from the New York headquarters declaring that "a man is not qualified to take charge of and operate an auto unless he has had a few years' experience in machine shops." The club has appointed a board of examiners to question applicants for membership and put them through a series of tests in driving. Members of the club will, it is said, be forbidden to instruct coachmen in the operation of a car. A number of wealthy men in the East have placed their coachmen under the instruction of professional chauffeurs, finding that the coachmen are careful and experienced in caring for the bodywork and upholstery.



"WHISTLING BILLY" VS. STEWART-GARBUTT SPECIAL, AGRICULTURAL PARK, LOS ANGELES, CAL.

Bay State A. A. Will Be Busy.

BOSTON, March 26.—The hill-climbing matches on Parker Hill in Roxbury, last Sunday, seem to have started the ball a-rolling in that direction and much talk is being heard about future matches of the same kind and about a general hill-climbing contest for Patriots Day, April 19. Until last year it was customary for the Massachusetts Automobile Club to conduct a hill climb on Patriots Day, but last year the practice was discontinued. The Bay State Association has usually held a race meeting on May 30, the two organizations thus dividing up the holiday automobile attractions. This year, it is understood that the Massachusetts Club will not conduct a hill climb, and President L. R. Speare, of the Bay State, and other officers have decided that that organization will hold a hill climb provided a suitable hill can be found.

The former contests have been on the Commonwealth avenue hill, but this grade is no longer formidable for machines of the size and power that are common to-day. Parker hill has been suggested, but, owing to its location and the nearness of street car tracks, it is not thought that it would be possible to conduct a contest which would attract a large number of people. Several other hills in the vicinity of Boston have been suggested, and the committee which will be appointed in a day or two by President Speare will make its first business the selection of a hill and the securing of a permit from the authorities to use it. As soon as a hill is selected, the entry blanks will be issued.

The Jackson Automobile Company, through its Boston representatives, the E. P. Blake Company, has offered a cup valued at \$100 for a match climb up Parker hill between the Jackson and any four-cylinder stock car or cars sold under \$3,500, the contest to take place within thirty days. The Morrison-Tyler Motor Company, whose

Maxwell won one of the Parker hill matches, has decided to donate the money which it won to some charity, and has appointed a committee of newspaper men to select the charity.

Besides the hill climb, the Bay State Association will, as usual, hold a race meeting at Readville on Memorial Day, May 30. The application for a sanction was sent in some time ago to the old racing board of the A. A. A. No action was taken upon it, but it was passed along to the new board recently appointed, and the association expects to receive a sanction in a short time. The race meetings of the Bay State Association at Readville have been considered the best and safest in the country. The association has oiled the track thoroughly and therefore prevented dust and accidents. Owing to existing rivalry among the dealers, at the May 30 meet the stock car events will be numerous.

Another competitive event in which the Bay State Association is likely to take an interest is the proposed economy, fuel, endurance, and tire test from New York to the White Mountains and return. W. J. Morgan was in Boston during the show and consulted with President Speare and other officers of the association. He found them in favor of his plan, so that if the contest is run in July, as proposed, there will be undoubtedly a large number of entries from this city.

Chicago Racing and Touring Events.

CHICAGO, March 26.—It is possible that Chicago will have an automobile derby this summer. The members of the racing committee of the Chicago Automobile Club have taken the matter up, and, if the famous Washington Park track can be secured, the event will be held there. It is possible that the park may be in such a

shape by summer that the deal cannot be put through, as it has been for sale for some time. Should the derby be held, however, there will be great sport for the enthusiasts. Contests for racing machines, touring cars, runabouts, and "freak" cars would be put on the program, together with obstacle races, climbing tests, and endurance runs. Should Washington Park not be secured, there is a possibility that Harlem race track will be taken.

It looks at present as though the proposed 1,000-mile endurance tour, starting from the Chicago Automobile Club, extending through Milwaukee, Rockford (Ill.), Bloomington, Indianapolis, South Bend, and ending at the place where the start was made, will be held this summer, as the local dealers' association is enthusiastic over the plan and is considering the proposition of giving it its support. It would take the place of the Glidden tour in the West and would give many an opportunity of engaging in such a run. There will be an effort made to secure the cooperation of the Chicago Automobile Club, the Chicago Automobile Dealers' Association, the A. A. A. and the clubs along the route.

Charles A. Coey, one of Chicago's dealers and most enthusiastic racing drivers, has been invited by E. R. Thomas to drive one of the three cars which his firm is building this year for the Vanderbilt Cup race. Mr. Coey has not accepted the offer as yet, as he may drive one of his own cars in the race.

Oldfield's Southern Circuit.

ATLANTA, GA., March 26.—Barney Oldfield and Paul Albert gave Georgians a taste of automobile racing at Piedmont Park, this city, on Thursday of last week. There was a large attendance at the races, which consisted of several events with local competitors, a match race, won by Oldfield from Albert, and a two-mile time trial by Oldfield in 2:35.

The Turn of the Road in Sight.

Evidence Accumulates that Around the Bend Unjust Automobile Antagonism Will Not Be Found.

There is a vast difference between condemnation and punishment of the reckless driver and obstinate antagonism to the advance of the automobile. Throughout the country accumulates evidence that serves to show how near is the dissolution of unavailing prejudice, and the farmer is succumbing—grudgingly but still succumbing—to the influence of the automobile and what it will mean to country folk in general. The unjust persecution of the law-abiding automobilist is arousing spokesmen in his favor, and the universal trend is toward the appreciated acceptance of the great boon of the age. Herewith are instances from all parts of the country:

An Ohio Farmer on the Automobile.

AKRON, O., March 26.—Though a farmer and a candidate for the nomination for county commissioner, C. N. Gaylord, of Stow, is ardently in favor of the automobile. He is president of the Summit County Horticultural Society, and in his annual address said:

"The farmers might as well make up their minds now as later that the automobile has come to stay, and where there is one now, in five years there will be five to ten. I know that they scare horses, and that is not the worst of it; they scare my wife as well. Notwithstanding all this, I am glad they are here. I presume some of you think this is strange when it comes in direct competition to our horse-raising. That is not to be considered for a minute, because these machines open up to our laboring men a vast field for employment in their manufacture, and this is a class that ought to be thought of first of all, for they are the backbone of our country.

"On the average, one of the machines, from the raw material to the finished product, means the employment of one man nearly two years. Then the pleasure those who are able to own one of the machines must take, after being shut up all day in office and city, in getting into one and taking a spin into the country. Then have stringent laws governing the machines while on the road, and enforce them."

It is agreed that Mr. Gaylord is one among a hundred, but, nevertheless, there is a strong likelihood that he will be nominated for the office he seeks. The horticultural meeting resolved itself into a good roads meeting, and the district senator was instructed to vote for the State good roads bill now before the legislature.

A California Opinion.

SACRAMENTO, Calif., March 26.—The *Union* prints the following: There are two sides to the story of automobiling in the park. Undoubtedly a great many people do run their machines there at a highly dangerous speed and deserve arrest. Roistering parties going to and coming from the

beach make a great deal of disturbance. But, on the other hand, many of the park regulations for automobiles are ridiculous, being made by Lloyd, Spreckels and Dingee, the commissioners, all three of whom are horsemen and opposed to the "devil wagons." The police, too, are very hoodlumpish in their attitude toward the automobilists, and the stories told by some of our leading merchants about the language addressed to them by these policemen would make people think that they were in Russia rather than San Francisco.

Not an Evidence of Wealth.

BOSTON, March 26.—The *Transcript* comments in this strain: Speaking of automobiles and those who own them, doesn't it seem they have become so much an everyday possession that magistrates and other dignitaries who sit in judgment on troubles caused by mistakes of motorists should cease to think the word automobilist is synonymous with millionaire? Just the other day in New York a magistrate got very wroth with a physician, the driver of a motor car, who to avoid a bad place in the road had skirted along for a few feet on a lawn. So far as known the grass plot was not injured, but there was a policeman at hand and he thought it was an offense, and the next thing that happened they were all in court and the man on the bench was saying that he "was down on all the wealthy who violate laws." Many a man owns and drives an automobile to-day, for pleasure or for convenience, to whom the payment of a fine of \$10 is a matter of some moment. And while, of course, if he is guilty of breaking a law he should be just as liable as any other man, he does exist so frequently that it seems every court judge should be too wise to presume that owning an automobile is always an evidence of wealth.

Illinois Farmer Now Buys an Automobile.

PONTIAC, Ill., March 26.—This is from the *Leader*: Farewell, a long farewell to the automobile as a novelty. It is now a staple and comes under the head of vehicles and farm implements. When a man wants to buy an automobile now—counting out the millionaires—he does not go to the city to the accompaniment of a half-column flourish in the local paper; he goes down to his implement dealer and picks out a good, easy-running machine just as he would pick out a buggy or a corn planter. The country town dealers are buying automobiles in carload lots this year, and the hard-working single young man on the farm will henceforth buy an automobile instead

of saving up for a buggy built for one and a half. The little towns are really ahead of the cities in auto buying. That is because the small towns are content with single rigs run by one cylinder, while no automobilist in the city is anyone unless he has a \$1,000 machine fitted with \$2,000 worth of upholstery and driven by a four-cylinder ordinance smasher.

Discrimination in Greater New York.

BROOKLYN, N. Y., March 26.—Complaints are continually coming into the *Eagle* office from motorists who claim that the traffic squad, especially those mounted, discriminate against the motor vehicle. Only a few days ago a prominent Brooklynite had occasion to pass down Fourth avenue, which is laid out in Boulevard style, with a grass plot running longitudinally through the center. A mounted policeman was encountered when the car was on the right side of the highway, who held up his hand for the automobilist to slow down, although the car was not going beyond the limits of speed. At the same time a few rods in front three big loaded drays were passing down the avenue abreast, making it impossible for the motorist to get by without coming to a dead stop, and exerting the most careful handling. At the first crossing the other side of the street was taken to avoid the obstruction, only to find the same difficulty, a cavalcade coming abreast from the other direction. It seems again to be the same old story of forgetting that automobilists, as users of the highways, have equal rights with horsemen. In years to come this will be understood, and the present narrow and absent-minded attitude of some members of the traffic squad will appear incredible.

What Appeals to the South.

ALBANY, Ga., March 26.—The *Herald* in its editorial columns wisely states:

"The introduction of automobiles into the South should be encouraged, for every one transforms its owner into an ardent advocate of better public highways."

Minnesota Joins the Chorus.

DULUTH, MINN., March 26.—The *Herald* comments wisely: "Duluth will have a great many automobiles this summer, according to report. The more automobiles, the more good roads agitation."

Automobiles will soon be adopted as public carriages in Italy, where they are increasing rapidly in number. Two new Milan companies plan to operate automobile services in Lombardy and eventually to install such service in all parts of Italy, according to the British consul at Naples. The use of power boats has increased greatly at Naples, where they are becoming very popular for pleasure use, and in summer are safe enough for practical purposes of coasting and running across to the islands in the Bay of Naples.

The Laying of the A. C. A. Cornerstone



PRESIDENT MORRIS.

It was a shivering crowd composed mainly of the "Old Guard" of automobil- ing that gathered on Wednesday, March 21, on the north side of Fifty-fourth street, between Broadway and Eighth avenue, to participate in the ceremonies attending the laying of the cornerstone of the new home of the Automobile Club of America. The searching March wind encouraged record-breaking speed in the brief and simple ceremonies that occupied scarcely a score of minutes.

President Dave Hennen Morris in the opening address referred to the substantial growth of the club, and making particular mention of the cornerstone said: "This monument of stone should not typify only the idea of pleasure and sport, but all that is best in the future of automobil- ing. It should stand as a vital force of our modern civilization and illustrate at all times what is best and most serviceable in the future development of the motor industry."

Dr. Schuyler Skaats Wheeler performed the actual laying of the cornerstone. He said that the ceremony symbolized more than the mere construction of the building. "It stood for the erection of a structure having many features to facilitate and encourage the use of the horseless vehicle, its safe keeping, the improvement of the many branches of the mechanical arts, the making of actual tests and measurements, and to serve as headquarters from which may be conducted the work of improving the outside conditions relating to transportation."

Deposited in the cornerstone were the following: "A History of the Club," by George F. Chamberlin; the club book, the club badge, the present automobile laws of all the states, maps showing good roads, published by the club for the use of its members; a model of an automobile, a pair of touring goggles, a statement of aerial flights by the Wright brothers, the proof-sheets of "Three Men in a Motor Car," by W. E. Scarritt; a prophecy, "The Future of the Automobile," by Albert R. Shattuck; a book, "A Journey Through Other Worlds; a Romance of the Future," by Colonel John Jacob Astor; current numbers of the automobile trade journals, the silver coins of the United States, and the daily newspapers of New York City of March 20, 1906.

Ex-President A. R. Shattuck then es- sayed to prophesy concerning the future of the automobile. He said:

In the Bible are found the following words: "The chariots shall rage in the streets, they shall jostle one against another in the broad ways; they shall seem like torches, they shall run like the lightning."

One hundred years ago who then dreamed of the wonders the twentieth century has produced? The wonders of electricity? The wonders of steam?

In this age the telegraph is giving place to the telephone and to wireless telegraphy. the compound steam engine to the turbine engine, the horse to the automobile. As- suming we make as much progress each decade to come as each decade passed, who can say this prophecy will not come true?

The horse will become a draft and riding animal. The traffic of the world will be carried on broad, dustless highways by the automobile. The railway will fall into disuse, its cost will be wealth lost. There will remain but "a right of way and streaks of rust."

The automobile in its turn will disappear. to be replaced by the flying machine, and our children's children will wonder why their forefathers crept along dusty roads harassed by speed laws, as they shoot through the air, even to other stars, and say, with Em- erson, "Hitch your wagon to a star."

The ceremony closed with a short prayer by the Rev. W. Merle Smith, of the Central Presbyterian Church.

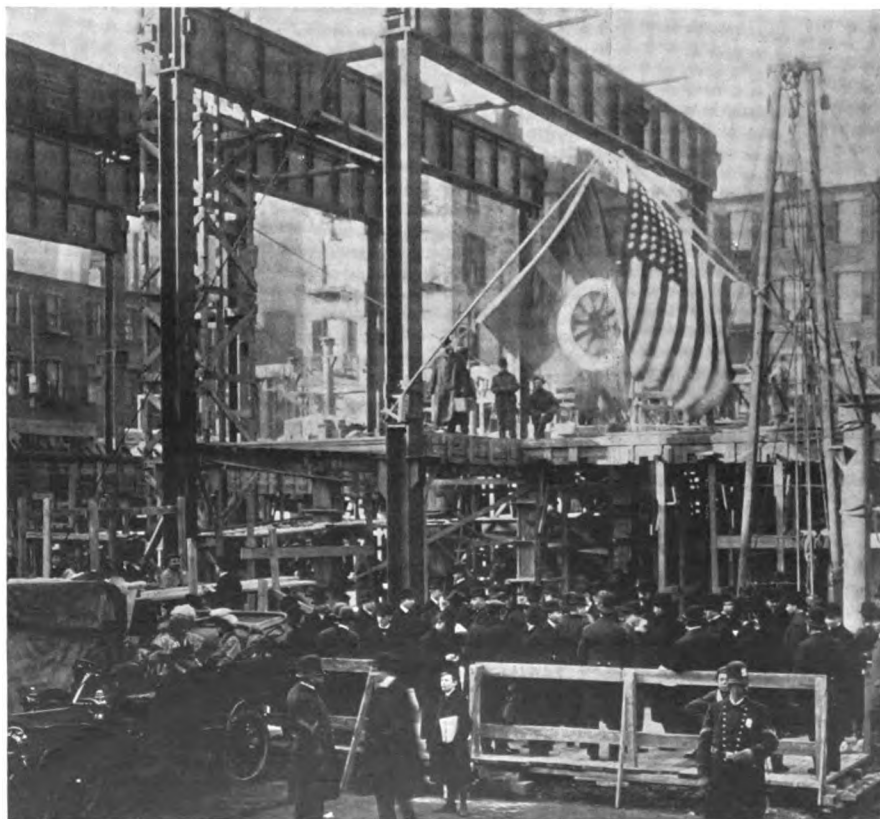
Among the notables present in addition to the principal actors were the following: Ex-President W. E. Scarritt, Gen. George Moore Smith, George F. Chamberlin, Jef- ferson DeMont Thompson, Street Commis- sioner Woodbury, S. H. Valentine, Cort- land Field Bishop, Colgate Hoyt, Capt.



THE LAYING OF THE STONE.

Homer W. Hedge, Augustus Post, Ward Chamberlin, Ernest Flagg, H. M. Swet- land, S. W. Taylor, Sidney Bowman, Frank Eveland, Emerson Brooks, Carl Page, W. H. Hurlburt, E. B. Gallaher, A. E. Ranney, J. E. Jarrige, A. D. P. Smith, Elliott Ma- son, and, of course, S. M. Butler, the in- defatigable secretary.

The new clubhouse will be eight stories high, with a front of granite, white brick, and terra cotta.



CEREMONIES OF LAYING THE CORNERSTONE OF THE A. C. A. CLUBHOUSE

Among the Automobile Clubs.

Germantown's Energetic Body One of the Best and Most Substantial in Pennsylvania—Its Great Road Project.

PHILADELPHIA, March 26.—The most active automobile organization in the state of Pennsylvania, and one of the few in the country which owns its own modern clubhouse, is the Automobile Club of Germantown, located at Greene and Carpenter streets, in the heart of the historic suburb from which it takes its name.

Starting less than two years ago with a handful of members, it built a handsome clubhouse and garage, intended for the accommodation of not more than 100 members. That limit was reached almost before the club had settled in its new home, and was successively raised to 150 and 200, the latter figure being the absolute limit until the accommodations can be increased. That increase of facilities, is indeed, already under consideration, and, with the membership now totaling 185, of whom over 125 are owners of cars (the garage can accommodate but 40), it will be seen that the proposed improvements cannot be begun too soon.

The Germantown club is composed of some of the most prominent professional and railroad men, manufacturers and merchants in the city—for its membership is drawn from all sections of the municipality—and its voice is always heard when matters of public policy appertaining to the sport or to the welfare of its especial section come up for discussion or decision at the polls or elsewhere.

Just recently—at its annual dinner, in fact—the club decided to take up the project of the Philadelphia-Pittsburg road in earnest, and its officials are now hard at work endeavoring to secure the co-operation and support of automobilists along the route in an effort to begin at once the improvement of at least a portion of the route, with the assistance of the State Highway Department. This route is but 284 miles in length, as compared with the railroad distance of 355 miles, and passes through Paoli, Lancaster, Columbia, York, Gettysburg, Chambersburg, Bedford, Greensburg, Irwin, Turtle Creek, to Pittsburg.

It is the intention of the Germantown club to take advantage of that provision of the new good roads law by which the state will pay 75 per cent. of the cost, the remaining 25 per cent. of the cost being divided equally between the county and the township. The state's portion of this money is lying in the treasury, and it is the intention of the club to work unceasingly in an effort to arouse the counties and townships along the route to the advisability of making a start at once. Almost the entire distance will be over roads which at one time formed a main trans-state highway, turnpiked as in those days the road sharps thought ideal.

Some of it is still kept in condition varying from fine to fair, but for most of the route the roads have been allowed to deteriorate till they are at some points little better than country roads. Some sections of this across-Pennsylvania highway is still cursed with the toll system, and this it is the purpose of the Germantown club to fight tooth and nail.

Now that an energetic organization has been formed to lead the fight, it is highly probable that within the next two or three years it will be possible for an automobilist to drive his car from Philadelphia between sunrise and sunset without fracturing the speed laws.

Activity of the Salt City Club.

SYRACUSE, March 27.—One hundred and ten members, an increase of 35 over the number of a year ago, shows the Automobile Club of Syracuse to be a growing organization. Fully 150 members are expected before the close of the summer, as new applications are in sight. The club is very active in the councils of the New York State Automobile Association of the A. A. A., and it supplies the state secretary in F. H. Elliott.

"Membership in the club is getting to be appreciated the more," said an officer, "since it has become more generally known what our objects are, especially in regard to courtesy toward all equipages and their drivers, observance of the rules of the road and such matters. The club stands for these, and the pennant of the club is becoming known throughout the section as a guarantee of the right spirit on the road. Episodes like that of last summer, when a member of the local club went fourteen miles out of his way to assist a vehicle which had broken down, are changing public opinion hereabout in regard to automobilists. Of course there are some exceptions, and these we do not want in our club. It is a matter worthy of note that the percentage of accidents occurring in this region, through the use of automobiles, is remarkably small. This fact is mainly attributable to owners largely driving their own machines. It is well known that a chauffeur, generally speaking, is less reliable and more apt to lose his head in a tight place."

The matter of road signs in this county is receiving careful attention. The first of these to be put up will be the danger signs, which will go in such localities as East and West Camillus Hill, Tully Hill and similar elevations where it is advisable to exercise special precaution. Another matter to receive attention is the placing of precautionary signs on the outskirts of the various cities and towns in the region. On

these signs will be placed the extreme rate of speed allowed by the community approached.

The signs directing drivers from town to town involves a greater work in the ascertaining of distances, provision for all cross roads and similar points of procedure, but it is stated that this matter will receive as careful attention as the others and work in all departments of this enterprise will be begun as soon as the roads are fit for traveling in the spring. Committees of the club are in charge of the work north, south, east and west of the city and intend to make the job a thorough one.

It is understood a proposition will be made to the club to have a third annual race day at the New York State Fair this fall. The success of the meet held last year was beyond all expectations, and some thousands of dollars went on the right side of the ledger, as the events attracted more than 10,000 persons.

The Energetic Long Islanders.

BROOKLYN, March 26.—Dr. C. B. Parker, winner of the 1905 Economy Test of the Long Island Automobile Club, has taken the chairmanship of the Runs and Tours Committee of that organization. A. R. Pardington, finding it impossible to give proper attention to the chairmanship of the committee, insisted upon the acceptance of his resignation. The Long Islanders intend to begin immediately the erection of suitable signs at crossroads throughout Long Island, and will ask the co-operation of the American Automobile Association in the work. The Runs and Tours Committee have under consideration the matter of a Brooklyn parade.

President Dick Leads the Quakers.

PHILADELPHIA, March 26.—The annual election of the Automobile Club of Philadelphia was held at the Manufacturers' Club last week, and, as expected, the slated ticket went through without opposition, William A. Dick being chosen president; Henry H. Roelofs, vice-president; J. Maxwell Bullock, treasurer, and H. Bartol Brazier, vice-president. The secretary's report showed 289 members. Alfred N. Chandler was made chairman of a committee on increased membership.

SPRINGFIELD, MASS.—The Automobile Club of Springfield is planning a club run in June, to extend over several days. Several routes are now under discussion. It is expected the automobilists from Holyoke and Worcester will participate. The Springfield club is eager to become active and increase its membership this season.

The Midland Railway Company of England has been making further experiments with motor trains on the London to Manchester route. The cars are built on the lines of the new electric trains and seat fifty passengers comfortably.

Hotchkiss Declining, Quayle Succeeds.

SYRACUSE, N. Y., March 26.—Yates Hotel was the scene of the third annual meeting of the New York State Automobile Association on Saturday afternoon, March 24. The clubs in attendance and the delegates representing them were as follows: Automobile Club of America, Emerson Brooks, New York; Automobile Club of Buffalo, W. H. Hotchkiss, August H. Knoll; Automobile Club of Syracuse, H. H. Franklin, F. H. Elliott; Binghamton Automobile Club, Norman M. Pierce; Rochester Automobile Club, H. S. Woodworth; Albany Automobile Club, O. A. Quayle; Automobile Club of Auburn, S. C. Tallman.

Mr. Hotchkiss, for two years president of the association, declined re-election despite strong pressure brought to bear on him to reconsider. The new board of officers chosen at the meeting is as follows: President, O. A. Quayle, Albany Automobile Club; vice-president, H. S. Woodworth, Rochester Automobile Club; secretary and treasurer, F. H. Elliott, Automobile Club of Syracuse.

Mr. Quayle has been the vice-president since the formation of the association, and a member of the legislative committee. He is well known among automobilists throughout the state, and has handled the bulk of the legislative business for the association. Mr. Woodworth, the newly elected vice-president, is prominent among automobilists in the western part of the state and has been a director of the state association since its incorporation in December, 1903. F. H. Elliott, re-elected secretary and treasurer, has held the office since the association

was formed and was practically its promoter and organizer.

The secretary's report showed a total of 17 clubs with 2,305 members. Every known organized club in the state is a member of the Association. Five clubs have been added in the past year with 757 members. Two years ago there were but 9 clubs with 1,253 members. The largest club is the Automobile Club of America, New York, with 842. Then follow Buffalo, 577; Long Island, 213; Rochester, 193; Syracuse, 103.

The Association has a good financial balance. Emerson Brooks, chairman of the Good Roads Committee, reported that the Association was lending its support. Giles H. Stilwell, of the Legislative Committee, discussed pending bills in the legislature. The directors are in sympathy with the movement to increase slightly the fee for registration of automobiles, but are opposed to excessive taxation. They advocate the passage of a bill by which the funds received from the automobilists shall be used for the benefit of the state highways. A resolution was passed placing the matter in the hands of the Legislative Committee, which was to hold a conference at the Ten Eyck, Albany, on Wednesday of this week.

The meeting heartily favored the plan of Charles T. Terry, of New York, who was the guest of honor at the recent annual banquet of the local club. His idea is that the clubs be a sort of clearing house for complaints against automobilists for reckless driving. The aim is to do justice in all cases.

At the Century Club, Saturday evening, all the directors who attended the meeting, and C. D. Hakes, secretary of the Albany club, Giles H. Stilwell, of Syracuse, President W. L. Brown, and Secretary Forman Wilkinson, of the Automobile Club of Syracuse, were guests at an informal though elaborate dinner given by H. H. Franklin.

General Club Doings.

ALTOONA, PA.—Blair county is in line and a new club has been formed with twenty-five charter members. R. H. Fay has been elected president and W. H. Wolfe secretary. The organization will be known as the Blair County Automobile Club and will be affiliated with the state organization.

LANCASTER, PA.—The Lancaster Automobile Club has elected the following officers for the coming year: President, Dr. S. T. Davis; vice-president, Philip H. Schaum; secretary, Jacob D. Rider; treasurer, Dr. Parke P. Breneman. The board of directors includes the above officers and H. M. Hillegas, Dr. H. S. Roop and Martin Kinports. It was decided to affiliate with the Pennsylvania Motor Federation. The club has succeeded in getting the tolls reduced from six to two cents a mile by the Danville Turnpike Company.

MINNEAPOLIS, MINN.—Plans are being made by the Minneapolis Automobile Club to connect the twin cities with an auto driveway by way of the picturesque Minnehaha Falls, of which Longfellow wrote so feelingly. At a recent meeting of that club it was decided to take permanent quarters at the Plaza Hotel. Plans are also being formulated to form a state automobile association, in order that the roads through the state may be improved.



CENTRAL PARK IN NEW YORK CITY, MARCH 24—A CHADWICK STOPPED FOR EXCEEDING SPEED LIMIT.

Letter Box

Proposed Glidden Tour Route.

Editor The Automobile:

[325.]—In all of the suggestions for routes for the touring competition for the Charles J. Glidden trophy this year, and the various criticisms of those proposed, no good reasons have been advanced for penetrating into Canada except the scenic attractions and the interest to the tourist possessed by the cities across the border. Although good in themselves, these do not offset the drawbacks of bad roads, customs annoyances, and the lack of beneficial interest in automobiling among the Canadians. Any benefits that can accrue from such an event—such as diminished opposition to automobiling, more liberal laws, and accessions to the ranks of owners—should be realized at home rather than in a foreign country.

Since the Glidden cup was won last year by a resident of Buffalo and a representative of one of the leading automobile manufacturing companies of America which is located in that city, the logical starting place for the 1906 tour seems to the writer to be at Buffalo, as a matter of courtesy to last year's winner. Aside from this, Buffalo has good claims to recognition among the automobile fraternity, and the reasonable desire of the Westerners to have the tour either start or finish as far west as possible would be fairly well met by such a selection. Buffalo is easily and cheaply reached by boat from Cleveland, Detroit, and Chicago, while it is fairly central by road between the East and West.

Mr. Glidden, donor of the trophy, has expressed the natural desire to have the tourists make Boston, his home city, a stopping place for at least one night, and as there is nothing unreasonable in the wish, it would be fitting if this were done.

Finally, New York, the acknowledged center of automobile interest in America, is a natural place for the finish and a good point for dispersal of the contestants.

Between these three points there should be a wide digression to afford variety of scenery and to increase the mileage to the 1,000 mark. For the reasons given, the writer suggests that the tour start at Buffalo and make Syracuse (approximately 150 miles) the first night stop, continue eastward down the Mohawk valley to Albany or Saratoga (about 140 miles) for the second night stop, then turn north and follow up the west side of the Hudson river and Lakes George and Champlain, through Elizabethtown and Plattsburg, skirting the Adirondack mountains and arranging night stops with regard to the distances, road conditions, and hotel accommodations.

In favor of the Mohawk valley route is the fact that it is one of the most important through routes in the country and is in great need of missionary work to accomplish the improvement of the roads. Moreover, it was the route selected for the first long-distance endurance run in America—the New York-Buffalo trials of 1901—and a tour over the same course five years later will form an interesting basis for comparison as a means of showing the advancement made in automobile engineering and construction.

Effect a crossing of Lake Champlain wherever convenient—if possible, by railroad ferry from Plattsburg to Burlington, Vt., or, if necessary, at Rouses Point, at the north end of the lake or at Ticonderoga at the south end. If Burlington is reached, reasonably level roads could probably be found on a route following the Central Vermont rail-

road through the Winooski river valley to Montpelier and thence down the White river valley to the Connecticut river; or, if the tourists wish to repeat last summer's most enjoyable visit to the White mountains, the line of the M. & W. railroad can be followed down the Wells river valley through Woodsville and up the Ammonoosuc river along the line of the Boston & Maine to Bretton Woods.

Boston can be reached by any suitable route, preferably different from the one of last year, and the run from Boston to New York can be by way of Providence and Hartford—avoiding Worcester naturally.

Objections that the country is mountainous in Vermont and the roads not good are hardly sufficient to stand in the face of the tour of 1906 through New Hampshire and the endurance run of 1903 to Pittsburg. The route would offer the greatest diversity of scenery and traveling conditions, would penetrate six states and pass through probably the greatest possible number of large cities especially interested in automobiling and the automobile industry. P. W. H.

New York.

Concerning American Racing Cars.

Editor The Automobile:

[326.]—Through patriotism and the ownership of an American car, I have become interested in American racing machines. The American is a good copyist and extremely original, but his originality seems to be his ruination in the racing line. The foreigners are many years ahead of us in automobile building and their methods of building cars have been refined carefully by age. It will take the same number of years to perfect the "freak" to such an extent that it will be able to compete with these well-tried-out types of automobile construction.

In the meantime, let us stick to the old lines and become copyists (not so much of the foreigners' but our own work), when it comes to going before the world with what should be the pick of our cars in the big cup races. Let those who favor these freaks make them perfect before we allow the honor of America to rest on such a fragile base. When they have done so, let them be welcome.

Glance over a list of the American freaks entered in the elimination trials for the Vanderbilt cup. In the trials there were only two cars of conservative racing build, one of which took first place and the other second. In the cup race which followed these same cars were the only ones running at the finish, one of them third and the other running well but in poor position through no mechanical fault.

Is not this a lesson by which our owners should profit in the teams sent to the Grand Prix and the next Vanderbilt Cup race?

William Remington.

Asbury Park, N. J.

New Roadways to Meet Modern Needs.

Reprinted from the New York "Tribune."

To the Editor of the New York "Tribune":

Sir:

Sunt quos curriculo pulverem Olympicum Collegisse juvat.

[327.]—So sang Horace two thousand years ago, and human nature has not changed much since. The automobilist says to himself and his friends: "It is a marvelous invention. Its speed is exhilarating. Its numbers are increasing every year. It has come to stay. The horse has got to go. As for pedestrians, they ought to get out of its way." All of which seems to him entirely reasonable. Logically, it leads to the conclusion that in the more distant future our thoroughfares are to belong solely to motor cars.

The anti-automobilist, on the other hand, says: "Our streets and highways were laid out during the nineteenth century for the use of pedestrians and horse-drawn vehicles. For that use they were then ample, though some of them have become crowded and congested now. To thrust into them a third species of locomotion, of which greater capacity for speed and much less facility of stopping, is simply to promote confusion and delay, and to invite disaster to life and limb. Horses are also increasing in number, and so are pedestrians, as the city and country increase in population. For public safety and convenience, all vehicles should be required to go at similar rates of speed." All of which is based on common sense, but offers small comfort to those who love to ride in motor cars.

Now, if some dispassionate observer could be put in a place of comparative safety—say the top of a tree on a country road or the top of a skyscraper in the city—he might watch the scene. Looking down on the buzzing swarm that strives and twists in the roads below, the irresistible conclusion to his mind would be, "Why, this is an attempt to achieve the impossible! The wisdom of ages has taught us that no man can get a quart of wine into a pint bottle. Yet here we are trying to force three processions into roads made for only one or two. If, as we are assured, all three are increasing in number and all are entitled to their normal rate of speed, then there is nothing ahead but a deadlock or a smash. Clearly, the remedy is to open new roadways for the swift-moving motors, or, if it is decided to give up the old ones to them, then to open new roads for the horse-drawn vehicles and the pedestrians."

The expedient would not be a new one. When locomotives were invented, eighty or more years ago, the attempt was made to use the public highways for their rails. It was soon discovered that it would be better, both for the railway companies and the general public, that they should have roads of their own.

So, not very many years ago, when it became the fashion to drive fast trotters, their use on the city avenues became intolerable. The difficulty was happily solved by the construction of the speedway and the race-courses, where the drivers can speed to their hearts' content and the public can stand by and "watch the wheels go round."

Frederick W. Seward.

Montrose-on-the-Hudson, N. Y.

AN EXAMPLE TO BE FOLLOWED.

Mr. Smith, of Cartersville, Ga., has the right idea, and from the Cartersville *News* the proof is herewith given:

"M. D. Smith, who recently moved from Dalton to Cartersville and has charge of the manufacturing enterprise in the old court house, will bring with him for the use of himself and family an automobile. Some anxiety has been felt by the ladies who are accustomed to drive horses on the streets of Centerville lest the automobile frighten the horses and make driving more dangerous.

"Mr. Smith is very anxious to relieve all anxiety on this score and asks the 'News' to say that every precaution will be used by him to avoid frightening horses. Any person who has a horse that shows a disposition to shy at the automobile is asked to go out on the road with Mr. Smith and let the horse become accustomed to the machine. Horses soon become acquainted with these automobiles and after one or two meetings, if properly handled, pay no attention to them. Mr. Smith will use every precaution to avoid frightening horses."

The Busy Automobile Lawmakers.

One Bill, and Excellent, Passed at Albany, with Other Measures Pending—What Is Happening in New Jersey.

ALBANY, N. Y., March 26.—Automobile or motor vehicle legislation is moving. One measure passed is Assemblyman Cox's bill amending the present law by inserting in the section, which now permits the automobilist on being arrested to give a cash bail or leave his motor vehicle as security, a provision that he may be released from custody on giving "a bond or undertaking executed by a fidelity or surety company organized under the laws of this state and having a deposit of at least \$200,000 with the superintendent of insurance of this state, said bond or undertaking to be in an amount not exceeding the maximum fine for the offense with which the owner is charged and to be conditioned for the owner's appearance in answer for such violation at such time and place as shall then be indicated." This bill now goes to the governor, who will sign it, as there has been no opposition to it in the Legislature.

The Senate Committee on Taxation reported favorably the bill introduced by Senator L'Hommedieu to tax motor vehicles and use the money for the maintenance of good roads. The bill was reported under an agreement between Senator L'Hommedieu, the committee and O. A. Quayle, of the New York State Automobile Association, that if a hearing was desired Thursday, March 29, the bill should be recommended for the hearing.

The provisions of this bill in its last amended shape are interesting to every owner of a motor vehicle. They are as follows: The present law is amended to provide for additional information to be furnished the Secretary of State about the weight of every motor vehicle heretofore or hereafter registered. The new matter reads:

Every person owning a motor vehicle, who has not filed a statement in pursuance of this section in which the weight of such vehicle is specified shall, on or before June first, nineteen hundred and six, file in the office of the secretary of state a supplemental statement of the name of such owner, the registered number of his motor vehicle, and the weight thereof. The weight of a motor vehicle includes the weight of the tires, lamps, top, and other equipment ordinarily used therewith.

The act is then further amended by adding thereto the following new sections to be numbered sections nine, ten, eleven, twelve, thirteen, fourteen, and fifteen, respectively, to read as follows:

Sec. 9. State tax on motor vehicles.—An annual state tax of one dollar per vehicle, and an additional fifty cents for each five hundred pounds or major fraction thereof in the weight of such vehicle exceeding five hundred pounds is hereby imposed upon every motor vehicle except motorcycles owned by a resident of this state except a motor vehicle owned by the manufacturer thereof, or by one whose principal business is that of a dealer in motor vehicles, but

this exception shall not apply to a motor vehicle in the usual personal use of such manufacturer or dealer; nor shall the tax be imposed on motor vehicles constructed, owned and used for the transportation of goods, wares or merchandise, nor on any motor vehicle regularly let for hire and which is operated wholly within the corporate limits of a city. The tax shall accrue and be based upon the ownership of such vehicle on June first of each year. In case of the acquiring of the title of a motor vehicle after June first of any year, other than one upon which the tax has been paid, the tax shall accrue with such title and be paid pro rata for the remainder of the year. The filing of a statement of weight of any vehicle registered with the secretary of state shall not preclude the secretary of state from determining the weight of any vehicle subject to tax. The term owner as used in this section and the subsequent sections of this act includes a vendee having the possession of a motor vehicle under a contract of conditional sale, although the legal title to such motor vehicle remains in the vendor.

Sec. 10. Lien of tax and payment thereof.—The tax imposed by this act upon a motor vehicle, together with any unpaid interest thereon, shall become a lien upon such vehicle on the date of the accrual of such tax. Within thirty days after such tax accrues, the owner of each such vehicle shall transmit to the secretary of state the amount of such tax; and the secretary of state shall issue to such owner a receipt thereof, specifying the name of the owner, the registration number of the vehicle on which the tax is paid, the weight thereof and the amount of tax paid. If such tax is not paid within thirty days after the same accrues, the amount thereof shall bear interest at the rate of two per centum a month.

Sec. 11. Effect of failure to pay tax.—If such tax is not paid within thirty days after the same accrues as required by this act, the owner of such a motor vehicle, notwithstanding his registration under this act, shall forfeit all rights acquired thereby, and shall be subject to the same penalties and liabilities, civil and criminal, for operating such vehicle upon the public highways, as if such vehicle were not registered. On the first day of June following the passage of this act the secretary of state shall prepare printed lists giving the numbers, owners' names and addresses contained in the applications for registration of automobiles on file in his office, and shall furnish a copy of the same by mail to the police department of every city and incorporated village in the state. On the first day of every month thereafter he shall prepare and distribute as aforesaid supplemental lists of all registrations during the preceding month.

Sec. 12. Collection of tax.—If the tax imposed on a motor vehicle by this act is not paid when due, the secretary of state may enforce its collection, with accrued interest, by an action against the owner thereof on the date when such tax accrued, in any court of competent jurisdiction; or he may issue his warrant under his hand and official seal, directed to the sheriff of any county of the state, commanding such sheriff to levy upon and sell the motor vehicle on which such tax and interest is a lien, if the same can be found within his county, for the payment of the amount of such tax, with accrued interest thereon and cost of executing

the warrant, and to return such warrant to the secretary of state and pay to the state treasurer the money collected, by virtue thereof, at a time to be therein specified, not less than sixty days from the date of the warrant. The sheriff to whom any such warrant shall be directed shall proceed upon the same in all respects with like effect and in the same manner as prescribed by law in respect to execution issued against property upon judgments of a court of record, and shall be entitled to the same fees for his services in executing the warrant to be collected in the same manner.

Sec. 13. Exemptions from other taxation.—The taxes imposed by this act upon motor vehicles shall be in lieu of all other taxes, general or local, to which motor vehicles as personal property may be subject under the laws of this state; and the owner of such a vehicle in the assessment of a tax provided by this act shall not be entitled to any deduction for debts owned by him either on account of the purchase of such vehicle or otherwise.

Sec. 14. Payment of tax before registration of motor vehicles.—The secretary of state shall not hereafter register any motor vehicle pursuant to this act, unless at the time of filing the statement required by section two of this act, the owner of such vehicle shall have paid such tax for the then current year, but if the motor vehicle for the registration of which application is made was not owned by a resident of this state on the date fixed by this act for the accrual of taxes for the then current year, such owner shall only be required, in order to procure registration of such vehicle to pay a tax proportioned to the length of time between the date when such a motor vehicle was owned within the state, and the first day of June succeeding.

Sec. 15. Application of taxes and filing fees.—Taxes and filing fees collected in pursuance of this act shall be paid into the state treasury, and shall be expended under the direction of the state engineer and surveyor for the repair and maintenance of highways constructed under the provisions of chapter one hundred and fifteen of the laws of eighteen hundred and ninety-eight, and the acts amendatory thereof and supplementary thereto.

More of the Albany Grist.

The Lee bill to make motor vehicles reduce speed to a mile in six minutes within twenty rods of every horse or draft animal it meets and come to a full stop within ten rods unless the rider, driver, or leader of the animal has graciously nodded or waved a permission to proceed, is going through the Assembly without opposition so far, and is already on third reading. It is believed that it will be challenged when it comes up for third reading and defeated.

The Situation at Trenton.

TRENTON, N. J., March 27.—The Frelinghuysen bill now rests in the hands of the Judiciary Committee of the Assembly. Exactly in what form it will emerge is extremely doubtful, the impression prevailing that it will be shorn of its obnoxious features. Senator Frelinghuysen is so much exercised over this probability that he threatens to introduce another measure fully as distasteful to automobilists, but his motorphobia is of such a pronounced character that he is not attracting as much serious attention as he did.

State or City Registration, or Both?

That Is the Bothersome Question Which Now Confronts the Automobilists of the Quaker City.

PHILADELPHIA, March 26.—“On the field of battle a general officer supersedes a colonel, and when a superior appears the general officer is superseded,” said Attorney-General Carson before the Supreme Court last Friday, when arguing that the state automobile license law had precedence over any municipal regulation. When Congress passed a national bankruptcy law all state bankruptcy laws were suspended. In the same way the state automobile law supersedes the city ordinance.”

The Attorney-General delivered a forcible argument, punctuated with similar good points, and when he had finished Chief Justice Mitchell announced that the Court would hold the matter under advisement.

The case had been brought up on appeal from Common Pleas Court No. 4, which had decided that the city had a right to charge a local license fee of \$2 in addition to that of \$3 provided for by the State law. Ira J. Williams, the attorney of the Automobile Club of Philadelphia, in arguing for a reversal of the lower Court's decision, claimed that the city cannot compel the taking out of a license for anything the State has already licensed.

“The city,” he said, “is a mere creature of the state, and exists only by the power of the state. There is a conflict of authority, therefore, when the city refuses to recognize a license issued by the state. A Philadelphia license will not hold good in Montgomery County, five miles from the City Hall, and rightly. A state officer would refuse to recognize it. Such a condition would establish a precedent which would enable every hamlet, borough, village and city in the state to require similar local licenses, and confusion without end would result.”

Assistant City Solicitor Alcorn, for the city, argued that should the argument of counsel on the other side prevail, it “would be impossible for the city to say that the minimum speed for cities—ten miles an hour—is too great for Chestnut street, and should be reduced. According to the state law no other than the state tags shall be carried on the front and rear of a machine. The city does not conflict with that. The local ordinance merely requires that the city tag shall be exhibited. It may be put anywhere on the car.”

Many local automobilists fear that the city's contention will be upheld.

Slow to Register in Indiana.

INDIANAPOLIS, March 26.—One would not infer from the standpoint of Secretary of State Storms that the automobile industry is one of the largest in this state, taking

into consideration the reluctance of automobile owners to register their cars with the state.

Since the law went into effect last June, just 2,726 cars have been registered, only 71 of which have been registered in 1906. So far there have been few arrests for failure to have state numbers and there is no general inclination to get them. Automobile authorities say there are at least 4,000 automobiles in operation in the state, about 600 of which are owned in this city.

Nothing Probable in Ohio.

COLUMBUS, O., March 26.—It is doubtful if the General Assembly of Ohio will enact any legislation affecting automobiles at this session. On Thursday the house spent much time discussing the Bowers bill, requiring the registration of automobiles with the county auditor, and finally sent it to the foot of the calendar, to keep company with the Sawicki bill, which provides that the registration shall be with the Secretary of State. There was a diversity of opinion among the members as to which bill should be passed, and meanwhile further consideration of their relative merits will be made.

Quebec's New Automobile Regulations.

MONTREAL, March 26.—Quebec has a new law on its statute books which requires the licensing of motor vehicles, the Provincial legislature having passed the bill recently introduced by the Hon. Mr. McCorkill. The bill was aimed principally at the owners of foreign machines, who, dashing into the Eastern townships from the American frontier, disregarded all laws of safety and endangered the lives of pedestrians and others by their reckless driving.

The act requires that every person acquiring a motor vehicle shall, for every such vehicle owned by him, file in the office of the Provincial Treasurer a statement of his name and address, with a brief description of the motor vehicle to be registered, with the name of the manufacturer, factory number, style of vehicle, motive power and strength thereof, on a blank to be supplied by the Provincial Treasurer for that purpose, and he shall pay a registration fee of \$5, and that such fee shall be sent in with the application.

Owners of automobiles who reside in other Canadian provinces are not required under the new law to register in Quebec provided their machine bears number indicating registration elsewhere, and they give notice in writing to the clerk of the municipality in or through which they make use

of their vehicles. Owners or operators of automobiles who do not reside in Canada must furnish a satisfactory bond to the Provincial Treasurer for an amount of \$500 as security for any damage which may be caused by him in operating his automobile in the province of Quebec. The Provincial Treasurer may, however, make individual exceptions to this provision if he sees fit. Non-Canadians must be provided with registration tags from their respective communities and comply with the formalities of notification of municipalities.

Every person desiring to operate an automobile otherwise than as a chauffeur must obtain an operator's license and present such evidences of fitness as the Provincial Treasurer may require. Professional chauffeurs must also obtain licenses good for one year. Licenses expire April 1 of each year, and the annual fee for both owners and chauffeurs is \$5.

The speed limit under the new act is six miles per hour for cities and towns and fifteen miles for the open country. When approaching sharp angles, bridges or steep descents, or intersecting highways and crossings, speed must be reduced to four miles per hour. Signals must be blown when approaching angles in the highway.

Virginia's New Law.

RICHMOND, VA., March 26.—On April 13 the Byrd automobile law, passed at the last session of the Virginia Legislature, will go into effect. As one of the provisions of the measure requires that automobilists shall stop and go to the assistance of drivers of horses or other animals that may be frightened at the machine, women who drive their own cars are in a state of nervous apprehension as to what is expected of them when such a situation presents itself. The bill also requires automobiles to be registered.

South Carolina Has a New Law.

COLUMBIA, S. C., March 26.—A new law was enacted by the recent legislature which requires the registration of automobiles and motor vehicles of all descriptions. A fee of one dollar is exacted and county clerks are authorized to issue the certificates to the operators and tags for the machines. Penalties for violation of the statute are fines running from \$20 to \$100, or imprisonment at hard labor for not more than thirty days.

To Tack the N. Y. M. C. Flag to the "Pole."

That Is What Walter Wellman Will Do When His Airship Lands Him on the Frigid Staff.

The New York Motor Club at its smoker, held March 23, at the Hotel Wellington, New York City, entertained Walter Wellman, the exploring newspaper man who is going to try to find the North Pole with the aid of a dirigible balloon and motor sleds. Other noted aeronauts such as Paul Nocquet, Charles Levee, and Mr. House, an optimistic New Englander, were also at the guest table, in company with Augustus Post, the treasurer of the Aero Club of America. R. H. Johnston capably steered the evening's doings.

Reference was made to the discussion at the organization of the New York Motor Club, two years ago, when it was decided, after some debate, to include air navigation as one of the objects of the club's existence. The presence of Mr. Wellman made apparent how rapid had been the progress in the direction of motoring in the air.

To Mr. Wellman was presented a flag of the New York club, which he promised to "tack to the pole" when he found it.

"I am no enthusiast, no hero," said Mr. Wellman, "and I have no desire to reach the North Pole without a return ticket and a chance to use it. My two previous trips into the Arctic zone have made me well acquainted with the conditions and the customary winds. My airship has been designed on a different principle from all preceding ships of this character. It is not built for speed. It is to make from 12 to 15 statute miles an hour, and 5,500 pounds of gasoline will be carried as fuel. This will drive the ship for a distance of 1,760 miles, requiring about 140 hours. The distance from Spitzbergen to the pole is estimated at 1,200 miles, so I will be provided with 50 per cent. more carrying force than is absolutely necessary.

"You perhaps may ask how I am going to get back, as the airship will not carry enough fuel to come entirely home by it. Well, I am now having built in Paris and America two experimental motor sledges. Each will weigh from 210 to 215 pounds. They will be equipped with small engines, and will only carry the two persons operating them.

"One difficulty is in going from a given to a mathematical point, but having arrived at the North Pole we have this advantage—all the winds blow to the south. Sailing with the winds, our ship might be carried to Siberia, and although I have no love for that country, it would mean safety. We might reach Green-

land, or Franz Josef Land, where I left a large stock of supplies on my last trip. Anywhere on land is safety, and with these motor sledges we can reach civilization. If they fail, I shall have to use the Arctic dog sledge.

"I accept the entire responsibility if any mistake occurs. The best French aeronauts and students have agreed that the plan is feasible, but many doubt its success. The final decision to adopt this method was mine, and any blame will attach to no one but myself. No one knows of how much or of how little value the discovery of the north pole will be. One opinion is as good as another. The scientific spirit is to go and find out and discuss it afterward, and that is all that I hope to do."

Accompanying the American will be Gustave Hervé, the experienced French air pilot. The aerostat is being made by Louis Godard. Its total length will be 160 feet, and the largest diameter 62 1-2 feet. From its largest diameter, about one-fourth from the fore end, it terminates sharply to a point, and curves back gradually to an ellipse. The central part of this large balloon will have several layers of strong silk, pure Para rubber, cotton, rubber, cotton and rubber, while the ends will have the same layers, though of rather lighter construction. The keel suspended underneath will have two engines, one of 50 horsepower actuating a propeller in front and capable of giving a speed, it is said, of fifteen miles an hour. The other motor of 25 horsepower is held in reserve and drives a smaller propeller at the rear. The engines can be driven simultaneously or separately.

The total weight of the balloon is 2,800 kilos, made up as follows: balloon, 1,425 kilos; keel, 330 kilos; cords for suspension, ropes, etc., 125 kilos; rudder, 50 kilos; 50-horsepower engine 275 kilos; propeller and gear, 95 kilos; ventilator with motor for keeping the compensating balloon filled, 50 kilos; anchors, etc., 100 kilos; tank and radiators, 25 kilos; 25-horsepower engine with shaft, 200 kilos; propeller with spare shaft, 95 kilos; accessories, 35 kilos.

Besides the explorers and mechanics, water and fuel, and provisions for 75 days, the balloon will carry four motor sledges, a light steel boat, and a guide rope of steel.

TO THE NORTH POLE BY AUTO.

MINNEAPOLIS. March 26.—A special to the *New York Times* says that Charles E. H. Burch and Frederick R. Burch, Minne-

apolis men, will attempt to reach the North Pole in an ice automobile of their own invention. The vehicle is supplied with all the comforts one might expect to have in a houseboat.

The inventors have engaged in exploration in Alaska more than once, and it was for the purpose of making trips on the trackless wastes of Alaska in quest of mineral wealth that their idea was perfected and a working model was built. After they had the vehicle in working order the idea of a polar exploration suggested itself, and the brothers announced that, while their original plan was not to discover the pole, there was no reason why they could not make the trip if the proper interest was shown in the expedition.

They have the automobile in operation at Lake Calhoun, where it was inspected yesterday by interested residents of Minneapolis. It is built like a large street car and is heated by hot water. The Burch brothers assert that they have selected a route to the pole that is as sure as their means of locomotion is certain. They believe they will be able to obtain ample financial backing for the venture.

TO THE SOUTH POLE BY AUTO.

MIDDLETOWN, N. Y., March 26.—Three automobiles are being constructed by Theodore A. Cook, a brother of Dr. Frederick A. Cook, of Brooklyn, at Calicoon, near here. These are for the use of the 1907 South Pole expedition. The cars will be of 24 horsepower each, and will be a combination of wheels and runners constructed after Mr. Cook's own ideas. The explorers expect to cover ten miles an hour over the ice with these cars, running continuously night and day. The cars will be put into use when a point is reached beyond which navigation is impossible. Fred Cook, a son of the manufacturer, will accompany the expedition as one of the chauffeurs.

COUNT DE LA VAULX IN AMERICA.

Count Henri de la Vaulx, the French aeronaut, is again in this country, having arrived March 24 on *La Savoie*. The Count comes here on the invitation of officials of the Aero Club of America and will participate in various air journeys before his return. The noted Frenchman between January 19, 1904, and December 9, 1905, made fifty-nine ascents, though he was in America for six months of this period.

Plans for a clubhouse, 75 by 65 feet, to be located at the foot of West One Hundred and Twelfth street and Hudson river, are being prepared for the Motor Boat Club of America. The city of New York has granted a frontage of 125 feet, but the new house will be built on made land beyond the present shore line. It is expected the new house will be completed by fall, in time for the annual motor boat carnival.

THE AUTOMOBILE CALENDAR AMERICAN.

Shows.

- Mar. 31-Apr. 7—Baltimore Automobile Show. Baltimore Dealers' Association.
- Mar. 31-Apr. 7—Toronto (Canada) Automobile Show. Toronto Dealers' Association.
- April 4-7—Omaha Automobile Show, Auditorium. Omaha Dealers' Association.
- April 9-14—Canada Automobile and Motor Exhibition, Mutual Rink, Toronto.
- April 18-21—Denver Automobile Show, Coliseum Hall. Denver Auto Show Association.
- April 21-28—Canada Automobile and Motor Exhibition, Arena, Montreal.
- May 24-26—Open Air Show, Empire City Track, New York Trade Association.

Tours.

- June 6.....—Orphans' Day, Second Annual Celebration by the New York Motor Club.
- June 18-23—Second Annual Economy Test, New York Motor Club.
- July 28....—Annual A. A. A. Tour for the Glidden Trophy, starting from Buffalo or Cleveland.

Race Meets.

- April 9-12—Pablo Beach, Florida. Spring Meet Jacksonville Automobile and Motor Boat Club.
- April 19....—Boston, Annual Hill Climb, Bay State Automobile Association.
- April 25-27—Atlantic City (N. J.) Automobile Meet.
- May 10....—Wilkes-Barre, Pa., Centennial Jubilee Hill Climb.
- May 30....—Chicago Motorcycle Race Meet. Chicago Motorcycle Club.
- May 30....—Boston, Annual Meet of the Bay State Automobile Association, Readville Track.
- July 4.....—Milwaukee Motorcycle Race Meet or Reliability Trial. Milwaukee Motorcycle Club.

FOREIGN.

Shows.

- Mar. 24-31—London, Agricultural Hall, Cordingley & Co.'s Motor Show.
- April 1-17—Budapest Exhibition. Auto Club of Hungary.
- April 15-May 1—Marseilles (France) International Automobile Exhibition.
- April 15-May—Milan (Italy) International Exhibition.
- April 28-May 6—Geneva (Switzerland) International Exhibition.
- Oct. 5-14...—Leipsig (Germany) Exhibition, Krystall Palast.
- Nov. 1-16—Berlin (Germany) Automobile Exhibition.
- Nov. 15-24—London, Olympia Motor Show.
- Nov. 23-Dec. 1—London, Stanley Show, Agricultural Hall.

Tours.

- May 6....—Targa Florio Tour (Sicily). Auto Club of Milan.
- May 12-18—International Light Touring Car Competition, Vienna to Gratz and back. Austrian Automobile Club.
- May 13-14—Tour de France. Motorcycles and voiturettes.
- May 15-16—Le Coupé d'Or and International Automobile Congress, at Milan, Italy.
- June 5-18—Herkomer Cup Touring and Speed Trials, Munich, Bavaria.

June 11-16—Land's End to John O'Groat's. Auto Cycle Club of Great Britain.

June 13-16—Scottish Reliability Trials.

July 29—Aug. 15—Circuit Européen, 3,000 miles, Paris, Milan, Vienna, Berlin, Cologne, Paris.

Race Meets.

- May 27....—Motor Cycle Club of France Championships.
- June 26-27—Le Grand Prix, Sarthe Circuit, France.
- June 29....—International Cup Race for Auto Cycles, Austria.
- Aug. 1-15—Circuit des Ardennes (Belgium).
- Aug. 15-16—Ventoux (France) Automobile Meeting.
- Aug. 14-19—Ostend (Belgium) Meet.
- Aug. 23....—Semmering Hill Climb.
- Sept. 27....—Tourist Trophy Race, Isle of Man, Auto Club of Great Britain.
- Oct. 7.....—Chateau Thierry (France) Hill Climb.

Motor Boat Races.

- April 1-15—Monaco (Italy) Motor Boat Races.
- April 17-19—Nice-Toulon-Nice (France) Motor Boat Race.
- May 6.....—Suresnes (France) Motor Boat Meet.
- June 28-29—Kiel (Germany) Motor Boat Races.
- July 1.....—Maison-Lafitte (France) Motor Boat Race.
- July 8.....—Le Coupé Dubonnet (France) Motor Boat Race.
- Aug. 6....—Motor Boat Race on the Rhone (France).
- Aug. 16-18—British International Cup Motor Boat Race.
- Sept. 16....—Juvisy (France) Motor Boat Meeting.

PATENT LITIGATION DECISIONS.

The Association Patents Co., a holding company which is an offshoot of the Association of Licensed Automobile Manufacturers, announces that it has acquired a basic patent on spark plugs in which the sparking points are surrounded by a recess for the purpose of preventing fouling and consequent short-circuiting. The patent is given as No. 612,701, issued to Frank W. Canfield, October 18, 1898. Another patent, issued to Mueller, is said by the Association Patents Co. to cover a plug detachable from the cylinder head, having a non-conductor disk bearing against the seat, and a circuit wire connected with a pole-piece extending through the disk.

Announcement has been made by the Diezemann Shock Absorber Co., of Hoboken, N. J., that the application of the Hartford Suspension Co., of New York, for an injunction restraining Hollander & Tangeman, of New York, from using the Diezemann shock absorber has been denied by Judge Lacombe in the Circuit Court of the Southern District of New York. The application was made pending the trial of a suit brought by the Hartford Suspension Co. against Hollander & Tangeman for selling the Diezemann device and for using the term "shock absorber," the Hartford company claiming that its patents cover every form of rotary vehicle spring retarding device and that the term "shock absorber" is its trade-mark.

Easy for "Mountaineer."

TRINIDAD, COL., March 22.—With the Raton pass, over the mountains of the same name, safely crossed and the good roads of Colorado under wheel instead of the adobe mud of New Mexico, the cruise of the *Reo Mountaineer* toward New York should now be child's play by comparison with the trip through California, through the desert, and across the territories of Arizona and New Mexico. It took us as long to traverse the trails of New Mexico alone as it did to cross the entire continent from New York City to Portland, Ore. following the line of the Union Pacific farther north.

At Trinidad we are attaching a new muffler to the car, as we have been informed that "a muffler that will muffle" is one of the requirements of the state automobile law. We have also fished out our old New York state license and once more attached it to the rear axle, secured a new oil reservoir for our tail light and a new gas generator for the one that we allowed to freeze and burst farther west, but we would go to almost any trouble to meet the requirements of a law made by a state or territory that provides such good roads as we have found since coming over the mountains into Colorado.

J. W. Catron and Frank McKane, the two Santa Fé automobile enthusiasts who set out to accompany us to Denver in their steam runabout, are now riding in the tonneau of the *Mountaineer*. Their machine met with an accident at Watrous and was shipped into Denver with our baggage.

From this point we abandon the old Santa Fé trail, which runs to old Fort Leavenworth, and strike off north directly to Denver. The roads are so good that we even have hopes of making the 220 odd miles between Trinidad and Denver in one day. The run from Denver to New York has been made by a number of automobile enthusiasts and, beyond Missouri and Illinois mud, we anticipate no great hardships.

To-day Fassett and I are changing the tires on our front wheels and replacing the pair put on at Boise City, Idaho, with the original set of Diamonds we discarded in Idaho and sent back to the Akron factory to be recovered. The tires we are taking off are air tight and show very little wear, but they are badly cut in places where they have come in contact with sharp lava rock or bounded over the rough stumps of small trees and left sticking up in the trail in many places through Arizona and New Mexico.

At Raton we were met by a delegation of automobilists, E. C. Sperry having sold several carloads of machines in that out-of-the-way New Mexican town. Besides automobiles, Mr. Sperry sells ice-cream. To freeze his cream he attaches a belt to the rear wheel of his car and over a large pulley on the ice-cream freezer. He then throws in the low-speed clutch, and in fourteen minutes his cream is frozen.

PERCY F. MEGARGEL.

New Jersey's Good Roads Building.

New Jersey's peculiar geographical situation, its proximity to the metropolitan district and unlimited possibilities for development as a residence center, has given the state a prominence that is distinctive, and everything pertaining to the improvement of highways in that commonwealth is of national interest.

Commissioner of Public Roads E. C. Hutchinson has just issued the twelfth annual report of his bureau, which discloses the interesting information that the state has expended a total of \$1,925,444.14 in the twenty counties of the commonwealth in road improvement since the adoption of the state aid law in 1892. The number of miles constructed since that time has been 1,111 and a fraction. As the state furnishes one-third of the total cost the gross amount expended can be readily calculated—\$5,776,332.42. During the year ending October 31, 1905, there were 67.78 miles of road built, at a cost to the state of \$164,648.99.

The commissioner says that the enforcement of the requirements of the new road law passed in 1904, that counties keep roads built by state aid in good repair or have moneys due them withheld has had a good effect. Special articles on road maintenance and prevention of dust are included in the report, which is replete with useful statistics, and supplemented by an official road map of New Jersey, drawn on a scale of five miles to the inch.

Of particular interest to automobilists are some of the recommendations made by the commissioner, who goes on to say:

"The automobile is now a recognized means of conveyance, and as such is entitled to the use of the highways, but there are certain appliances used upon them which are very detrimental to our roads. The damage done to the surface of our macadam and gravel roads by these appliances is so great that the question of a remedy is creating considerable agitation all over the different counties of the state. The temptation to get all the speed possible out of any means of locomotion is almost irresistible; therefore, no one should be allowed to run a machine upon our public highways without first obtaining a license, granted after a proper examination, as the majority of the accidents are caused by incompetent chauffeurs. If the high-speed machines are to be allowed upon our highways, they should be taxed in proportion to the maximum speed of which they are capable. In other words, they should pay for the damage they do, and all money paid into the State Treasury for such licenses should be applied to the maintenance and repair of our roads.

"Dust raised by an automobile, when running at a rate of less than twenty miles an hour, is not any worse than that raised by many wagons, but when this limit is ex-

ceeded the automobile becomes the dust nuisance. Many cures for the dust annoyance have been suggested, as the sprinkling of our roads with crude oil and different solutions of absorbent salts. These will prevent the dust, but are too expensive to be generally used. Our remedy, therefore, would be a strict enforcement of the speed limit, the abolition of armored tires, chain tires, and blowers, and a sprinkling of all of our improved roads early in the morning and late in the evening. This would preserve the roads and would reduce the cost of repairs very materially, at the same time giving us a better, smoother and more dustless surface than we now enjoy. There is no better or cheaper way of preserving our roads than by sprinkling. Water for this purpose can be obtained from neighboring streams, and, in those sections where there are none, from wells driven beside the road. In either case it is better and cheaper to pump the water into a tank, from which it can be drawn into the wagons, thereby saving much time."

Raritan River's New Bridge.

PERTH AMBOY, N. J., March 27.—Frequent announcement has been made that the new bridge over the Raritan river, connecting the place with South Amboy, would be completed by April 1, but such statements are inaccurate. It is thought only unforeseen legal difficulties can prevent the bridge being ready for use within a few months, as the contract for the sixty-foot steel span for the railroad spur probably will be given out this week. There are several phases of the bridge controversy still hanging fire in the courts, and the War Department has not been heard from officially as to its stand in the matter.

Automobile tourists from New York via Staten Island to the north Jersey coast resorts have always been obliged to go by the way of New Brunswick, a waste of considerable mileage, due to the absence of such a bridge as is now under construction. To reach the bridge from the Staten Island Ferry exit, Perth Amboy, the route is straight up Smith street, crossing tracks of N. Y. & L. B. R. R., six blocks, to Goodman street, left one block and then right one half block to bridge approach.

Even the completed bridge will call for a great deal of road building, for the following reasons: From Rahway to Perth Amboy (by which tourists from Newark and North Jersey would approach the bridge), is wretched, from Woodbridge. On the south side of the river the macadam road ends abruptly at Morgan, where the road leads along the beach of Raritan Bay; and it is no "Ormond." With one exception, the other routes leading from South Amboy are ordinary dirt roads, excellent when in condition, but usually muddy or

very dusty, sometimes sandy. The exception is the macadam road, through Sayreville and South river to Hardenbergs (or Tanner's) Corners.

NEW HAMPSHIRE'S PROGRESS.

New Hampshire has adopted a definite policy of highway improvement in keeping with its reputation as the great summer vacation state, and promises to be more than ever attractive to automobilists in the future. The three main highways which the state will build all lead to the White Mountain region. One starts at the seashore and follows the east side of the state through the famous resorts of the Crawford Notch section; one extends up the Merrimack valley, through the Pemigewasset valley and the Franconia Notch to Bretton Woods and Crawford's; the third will follow the Connecticut river along the western boundary. In addition to these main highways there are numerous mountain highways which are "state roads."

Labor Commissioner L. H. Carroll has issued a special report, covering the statistics of the summer business, which shows that the capital invested in summer hotels, boarding-houses, cottages, etc., has increased from \$10,442,352 in 1899 to \$22,285,179 in 1905; during the same period the number of summer visitors has increased from 170,280 to 309,243. The capital invested in summer residences and cottages amounts to \$11,327,879, and during 1905, 28,163 persons resided in such summer homes.

GRAFT BLOCKS ROAD WORK

WILMINGTON, DEL., March 26.—Active work on the construction of about a mile of new macadam road to connect Market street, the main thoroughfare of Wilmington, with the state road, has been delayed by the announcement of an increase of 25 per cent. in the cost of crushed stone. Private contractors had bid for the work at a price of \$9,500, but the Street and Sewer Department of the city notified the levy court that it could do the work cheaper itself; so the court decided to reject the bid and advertise for new ones.

New bids have not been received, but the department has been notified by two parties from whom it has been buying crushed stone of an advance of 25 per cent. in the cost, and it looks now as if the department would have to bid as high as the contractors unless it is able to find enough stone in street excavations, which it is now endeavoring to do. It has a crusher, which will be used if there is sufficient stone and the city gets the contract.

MM. Emile de Beukelaer and Channckx have completed a tour of inspection of the roads which have been selected as courses for the various events of the week of the Ostend (Belgium) meeting, August 14-19. The town of Ostend and the Kursaal have voted 50,000 francs toward the motor boat part of the meeting.



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" " This Issue.	- - - -	15,000
" " Since Jan. 1.	- - - -	214,000

Automobile From New Jersey, in his annual report, comes an assertion by the Commissioner of Public Roads, who, while admitting that the "automobile is now a recognized means of conveyance, and as such is entitled to the use of the highways," charges that "certain appliances used on them are very detrimental to our roads." These are enumerated as "the armored tire, the chain tire and the blower."

The automobile mileage of New Jersey probably exceeds at the present time the total horse mileage over the improved roads of the state; a year hence there will be no comparison between the motor-driven vehicle and the horse.

If the "armored" or "studded" tire does as much harm to a road as is done by the iron shoes of a horse and the narrow iron tire of the wagon which the animal draws, then the opinion of an unconvinced observer is very much astray.

Chains are invaluable when the highways have been deluged with rain, and the country traversed is hilly and circuitous. Unthinking automobilists are prone to utilize chains when this help could be dispensed with, and it would only be fair for this

class to bear in mind the protest of the New Jersey commissioner and to exert themselves to the extent of removing the offending adjunct when good highway is encountered, even though it be necessary to employ chains again during the same run.

"Blowers"—meaning probably both exhaust and fan—are an exaggerated method of injury, but even the automobilist will admit that a heavy touring car traveling at a high rate of speed will raise by suction loose portions of the road.

And it is at this point where the core of the whole subject is reached. If this modern method of travel—bound to be universal—injures the kind of roads which we now have, it is a question of the immediate future to construct a highway that will withstand the harder usage enforced by the coming of the automobile.

Referring to another phase—the apportionment of the cost of building these roads. The automobilist pays his share—and it is a goodly share, too—while the ruralist is a comparatively small contributor, the bulk of state taxation falling on the cities and the large towns. The ruralist is entitled to just as much consideration as any other user of the highway, but just that much and not any more, and because of the brainless use of the motor-driven vehicle by a few, the growing army should not meet with opposition at every turn of the road.



Futile Deductions from Horse Statistics

Attention has been called of late by various newspapers and trade publications to the number of horses and mules bred in the United States each year from 1890 to 1905, and their value. These figures were compiled by the United States Department of Agriculture. Different writers have sought to show by them diametrically opposite tendencies, some pointing out that the number of horses had increased from 14,213,837 in 1890 to 17,057,702 in 1905, and their average value from \$37.50 each in 1899 to \$70.34 in 1905. Others introduced the factor of the increasing human population of the country and showed that the number of horses is actually decreasing in proportion to the population.

Perhaps this proportional decrease accounts in some measure for the increasing price, although this is more likely to be due to the steady rise of prices for all products, whether of farm or factory, during the last five years. But the proportional decrease in the number of horses has not been so great as many might have supposed in view of the predictions that the advent of mechanical transportation would cause the "passing of the horse."

Manifestly it is impossible to base any approximately accurate estimate of the future of the horse upon statistics of the past decade or two. All the influences that have affected the breeding of draft animals heretofore may any day be displaced by

new ones. For example, automobile commercial vehicles are only just beginning to take their part in the transportation of merchandise. Ten years may cause as great a revolution in city trucking as it did in street car service, in which countless thousands of horses have been displaced—how many can never be known, but one has merely to attempt to picture the street car and interurban service of to-day throughout the country carried on with horses to imagine the number that would be required for it.

Similarly, we shall never know how many horses are finally displaced by automobile trucks, delivery wagons, omnibuses and cabs, for there will be no basis for comparison. The number of horses in proportion to population is not a safe basis upon which to make estimates, since the output of human endeavor, with the means at hand, has been multiplied manifold in the last quarter century in proportion to the number of inhabitants in the country. Conceive for a moment of performing the work of the country to-day by the means of even twenty-five years ago.

While there is every reason for believing that another generation will look upon horses in the streets of our cities with as much curiosity as we now gaze upon the very rare team of oxen and our children point with amazement at the surviving horse car in New York, only automobile enthusiasts of the greatest temerity have maintained that the immediate future holds forth promise of a more economical power for farm work than that of horse flesh. Yet, only this week the welcome news comes from Washington that the Ways and Means Committee of the House of Representatives has reported favorably the "free alcohol" bill now before Congress. The unlimited possibilities opened to the farmers by the enactment of a law removing the tax from denatured vegetable alcohol for the mechanical arts are as yet realized by only a very few, but already gas engine and farm implement manufacturers are busily engaged in designing and building machinery for doing all sorts of farm work with the power to be derived from such a fuel. In the end it may prove far cheaper for the farmer to make alcohol from beets to run his machinery and convert his pasture and hay field to more productive purposes than feeding his horse flesh. When that day comes the "passing of the horse" will be near at hand.



SINCE the State of New York gives the Board of Supervisors of Nassau County authority to grant permission for the running of the Vanderbilt Cup race over its roads, and this spectacle supplies the greatest free show ever given to the American public, would it be unreasonable if a regiment or two of State Militia volunteered to guard the course for this battle of the American and European automobile makers?

Discredited Criticism of Ex-Chairman Morrell.

Chairman Thompson Will Invite Mr. Morrell to Serve on the Recently Appointed A. A. A. Racing Board.

As the result of what is looked upon in automobile circles as unfair censure of ex-Chairman Robert Lee Morrell, the newly appointed chairman of the American Automobile Association Racing Board, Jefferson DeMont Thompson, will invite the ex-chairman to serve on the 1906 board.

In recent issues of his weekly paper, Samuel Walter Taylor, one of those recently invited to act on the 1906 Racing Board, criticised in violent manner the Board of the previous year, making particular reference to the energetic chairman of it. One of the headlines used by Mr. Taylor was "To Turn the Grafters Out." Exactly what was meant by Mr. Taylor is considered somewhat vague, for the reason that though Mr. Morrell was mentioned as being a stockholder in the Locomobile Company, and the impression was given that he had favored that concern's entry in the Vanderbilt race, such effort on his part was entirely unnecessary, as the car had qualified in the elimination event beyond any question of doubt. E. R. Thomas, the Buffalo manufacturer, in a telegram to President Farson, had wired in this manner:

"Robert Lee Morrell is said to be a large stockholder in the Locomobile Company. I respectfully urge that no one interested as agent or manufacturer of automobiles be appointed to act on the ruling boards. I am building three racers at a very large expense for the sole purpose of winning the Vanderbilt cup for America, and demand a square deal, which was not given me last time."

Subsequently it was denied that Mr. Morrell was a Locomobile Company stockholder, and S. T. Davis, Jr., the president of that company, makes the positive statement that he is not interested.

Previous to the denial, Mr. Taylor had printed the article on "Sportsmanship being subordinated to commercial interests by the managers of the big automobile races."

Mr. Morrell expressed himself in this vein: "I do not own a single share of stock in the Locomobile Company, and never did. I never have been financially interested in that or any other automobile company. I understand that the editor of the periodical which criticised me is Mr. Thompson's personal appointee on the new Racing Board. I am sorry he did not attempt to learn the facts before making such an unfounded charge against a fellow club member."

Chairman Thompson expressed himself as deeply regretting the criticism of ex-Chairman Morrell, and referring to the statement that Mr. Taylor was his personal appointee, said:

"This is an error. Mr. Taylor was invited to serve on the Board because I thought he would be a valuable member of it, having in mind the speech which he

made at the 1905 Automobile Club of America dinner, when he argued for friendly relations and co-operation of horseman and automobilist. However, I do not agree with him in his criticism of last year's Board, and think his remarks most unwise and indefensible.

"Mr. Morrell was a most efficient chairman, and his conduct of the Vanderbilt race entitled him to great credit. I shall be pleased to invite him to serve on the 1906 Racing Board, and hope that he will find it possible to accept."

It is understood that the members of the 1905 Board who have been invited to serve again this year are much incensed over Mr. Taylor's criticism, and the impression prevails that for his "break" he should tender his resignation to President Farson and Chairman Thompson.

Long Islanders Want Vanderbilt Race.

MINEOLA, L. I., March 26.—A petition which had received the signatures of about 1,500 residents of Nassau county who are in favor of having an automobile race on the public roads of the county this year was presented to-day to the Board of Supervisors. The petition is as follows:

"To the Board of Supervisors:

"We, the undersigned residents and citizens of the county of Nassau, do hereby respectfully petition your board to request the Automobile Association of America to hold its automobile test and race for the year 1906 over the course laid out by your board within the county in the year 1905."

It is rumored that a counter petition will be got up by the People's Protective Association, which was active last year in opposition to the Vanderbilt cup race on the public highways.

Of the three members of the Nassau Board of Supervisors Jones and Willets are in favor of the race, while Seabury is opposed to racing on the highways.

Vanderbilt Cup Race Items.

Up to the present time seventeen American cars are scheduled to participate in the American elimination trial for the Vanderbilt Cup race: Thomas, three; Pope-Toledo, three; Frayer-Miller, three; White, two; Maxwell, two; Royal Tourist, one; Chadwick, one; Queen, one; National, one.

The Vanderbilt Cup Commission will probably make an effort to secure assistance in guarding the course from the state militia.

E. W. Sutphen, through the Automobile Club of Great Britain and Ireland, will enter a 100-horsepower English Daimler in the Vanderbilt Cup race. It will probably be driven by Guv Vaughan.

Open-air Show Assured.

Decisive action was taken by four-fifths of the members of the New York Trade Association, who were represented at the committee meeting held Monday evening, in reference to the open-air show matter which had been under discussion for some time. The show will be held at Empire City track, May 24, 25 and 26, and Frank Eveland, W. M. Haradon and C. Andrade, Jr., constitute the committee of arrangements, with Alfred Reeves as manager. Under the grandstand 6,000 square feet of floor space can be used for exhibits, and tents will provide all the additional space required.

A leading feature of the show will be a balloon race in which all the prominent aeronauts will be invited to participate. As the prevailing winds in this section are inland, the conditions ought to be ideal for a race of this nature.

TORONTO'S SHOWS.

TORONTO, ONT., March 26.—The Canadian show circuit will open next Saturday afternoon, March 31, this being the event conducted by the Local Dealers' Association, with E. M. Wilcox acting as manager. The Hon. William Mortimer Clark, K. C., Lieutenant-Governor of Ontario, will formally open the show. All the members of the Ontario legislature (now in session) have been invited to attend the opening.

The exhibits will be housed in two buildings, automobiles of Canadian, American and European construction being in one building, with the motor boats and accessories in the other.

Following the dealers' exhibition will come the show conducted under the management of R. M. Jaffray, Jr., at the Mutual Rink. The dealers' show will close April 7, and the Rink show will begin April 9 and conclude April 14.

BALTIMORE'S FORTHCOMING SHOW.

BALTIMORE, MD., March 26.—Plans for the automobile show to be held in this city from March 31 to April 7 are progressing rapidly and, according to the management, extremely satisfactorily. It has been announced that a parade of automobiles will immediately precede the opening of the show on the first night.

Progress of Alcohol Bill.

WASHINGTON, D. C., March 26.—Decisive action was taken on the free alcohol matter to-day by a sub-committee of the Ways and Means Committee of the National House of Representatives, which agreed to report a free alcohol bill to the full committee on Wednesday of this week. The bill as outlined by the sub-committee takes off the internal revenue tax from denatured domestic alcohol for technical uses in the mechanical arts, and will go into effect three months after its passage.

The American Automobile Association.

Concerning the National Organization: Why It Deserves the Support of Automobilists, and What It Is Doing and Will Do for the Good of the Pastime.

The American Automobile Association has planned a far-reaching and comprehensive plan for the general good of automobiling and automobilists. In order to make apparent the national character of the organization, this year the Easterners have given way to the Westerners, and into the administrative department stepped John Farson, of the Chicago Automobile Club, as president; William H. Hotchkiss, of the Automobile Club of Buffalo, as first vice-president; Dr. Milbank Johnson, of the Automobile Club of Southern California, as second vice-president; and Sidney S. Gorham, of the Chicago Automobile Club, as secretary. Lewis R. Speare, of the Bay State Automobile Association, is the third vice-president; and George E. Farrington, of the Automobile Club of New Jersey, remains as the treasurer.

Secretary Gorham has entered upon an energetic campaign, and his first appeal to the automobilists of the country is herewith given:

Policy of the A. A. A. Directors.

The American Automobile Association is an organization of owners and users of automobiles, formed to protect and extend the rights and privileges of automobilists.

The declaration of policy adopted by the Directors states its objects to be:

1st. The uniting in one National body the automobile clubs of the country, and through them the individual automobilists.

2d. The promotion and furtherance of all matters of a national character in which automobilists are interested, as follows: (a) legislative matters, (b) good roads, (c) control of racing.

3d. Providing for its members direct benefits as follows: (a) reciprocal club privileges, (b) supplying through its information bureau facts regarding laws, touring routes, maps, racing statistics, etc., (c) a medium for the exchange of ideas and information of value to clubs in furthering their promotion and usefulness, and valuable to individual automobilists.

To Obtain Uniform Law.

The Law Committee, S. S. Gorham as chairman, and made up of one member of each club affiliated with this association, and of members at large in every state, in order that the advice of the best lawyers of the country who have made a special study of the laws pertaining to the use of automobiles may be available, will draft a bill providing for state regulation of the use of automobiles, and the American Automobile Association, through its constituent state associations, clubs, and individual members, will urge its enactment into law by the legislatures of the different states. The advantages of a uniform law providing for the recognition in each state of numbers and licenses issued under the provisions of the laws of other states, and giving to automobilists the rights and privileges to which they are fairly entitled, are universally recognized.

The Law Committee will advise members of the Association, without cost to them, as to their legal rights in respect to actions at law, either civil or criminal, in connection with the use of motor vehicles.

Will Contend for Good Roads.

The Highways Committee, William H. Hotchkiss as chairman, will work for good roads and aid their building in every possible manner. Bills providing for state aid in the building of hard roads will also be drafted and introduced in the various states. By a vigorous campaign a strong public sentiment in favor of state and national aid in good roads building will be aroused. Through the enactment of such laws the gradual and permanent improvement of our country's roads will follow.

Controls Automobile Competition.

The Racing Board, Jefferson DeMont Thompson as chairman, through its control of racing, will maintain the best interests of this branch of the sport and endeavor to eliminate all objectionable features. The sanction fee for members of the A. A. A. is \$10; for non-members, \$50.

What A. A. A. Members Are Entitled To

1. The privileges of all its constituent clubs and will be shown special consideration by foreign automobile clubs and associations.

2. To receive, on application to the national secretary, and without cost, special touring information, including the benefits of a system now being organized to inform automobilists where they can secure, when on tours, good hotel and garage accommodations and the services of competent repairers.

3. Information as to customs formalities and duties, and the driving regulations of foreign countries.

4. Information and advice generally, in connection with automobile matters.

5. A reduced subscription rate for the principal automobile periodicals.

6. Reduced railroad fares to the two big annual automobile shows.

7. A reduction of ten per cent. in the premiums charged for automobile liability insurance, and it is believed that the insurance department will soon be able to offer a corresponding reduction in premiums for fire and theft insurance policies.

8. A substantial reduction in the selling price, to non-members, of the best road maps published.

9. In addition to these personal advantages, automobilists, by becoming members of the Association, support and share in the direction of an organization for the purpose of

(a) Opposing unreasonable laws and ordinances restricting the use of automobiles.

(b) Negotiating with local authorities for the improvement of the roads and the removal of dangerous corners.

(c) Improving the hotel accommodations throughout the country.

(d) Generally undertaking work on behalf of automobilism which can only be discharged by a strong and united body, representative of all automobilists within the United States.

To Encourage State Associations.

It is the policy of the American Automobile Association to encourage the organization of state associations in every state where automobiles are in common use, the membership of these state associations to be made up of automobile clubs and individuals.

How to Join the A. A. A.

If there is no club in your immediate vicinity you are urged to join the state association, if there is one in your home state, and if not, your membership in the A. A. A. is solicited.

Membership in a club affiliated with the A. A. A., directly or through one of its constituent state associations, carries with it membership in the national body. The dues in the A. A. A. for individuals are \$2 per year, the membership fee for clubs is \$10 and the dues are \$1 per year for each member, and upon the organization of a state association, one-half of the moneys received from members in each state is remitted to the treasury of the state association.

With the local club speaking for the individual, the club backed by the state association, and the national organization behind all three, the results are certain to be beneficial and far-reaching.

Address all communications to Sidney S. Gorham, Secretary American Automobile Association, 31 West Forty-second street, New York City.

Ohio Association Organized.

COLUMBUS, O., March 24.—Delegates from leading clubs of the state met here this afternoon and completed the organization of the Ohio State Automobile Association, which will be affiliated with the American Automobile Association. The first steps for its formation were taken at a meeting held in Cleveland several weeks ago, at which arrangements were made to formally launch the organization at to-day's meeting, which was held in the handsome parlors of the Columbus Automobile Club, in the skyscraper of the Columbus Saving and Trust Company.

The purpose of the association is to advance automobile interests in Ohio. The delegates are most optimistic for the future of automobiling here and confident that unification of the clubs of the state will produce very beneficial results.

Officers were elected as follows: President, F. T. Scholes, of Cleveland; vice-presidents, F. E. Avery, of Columbus; Andrew Auble, Jr., of Akron; Walter C. Baker, of Cleveland; Val Duttonhofer, Jr., of Cincinnati; secretary-treasurer, R. H. Cox, of Cincinnati.

President Scholes named several committees, which will begin working at once for the good of the organization.

Among the delegates present were: Cleveland Automobile Club, Messrs. Scholes, Collister, Anderson, Price, Baker, Marvin and Foote; Columbus Automobile Club, Messrs. F. E. Avery, Curtain, Harmer, Repp, Leeds; Automobile Club of Cincinnati, Messrs. Cox and Duttonhofer; Akron Automobile Club, A. Auble, Jr.

An Automobile Parade in Honolulu.

By PACIFIC TRAVELER.

HONOLULU, T. H., March 1.—When home, we who celebrate Washington's birthday by trying to keep warm can hardly realize the way this day is celebrated in the Hawaiian Islands. "The Land of the Heart's Desire," as its residents fondly call their home. It is on this day that the people of Honolulu have their annual floral parade. At first it was confined to decorated carriages and horseback riders; and even in those days it was a sight worth crossing the Pacific to see, but as time has brought to those islands automobile after automobile, the parade has been added to and enlivened by an automobile division; in fact, in the parade held February 22 there were three divisions of automobiles, ten cars in each division; heavy touring cars comprising the first, light touring cars the second

own automobiles and were very conspicuous. One car was finished in the semblance of a native grass hut, in the interior of which Hawaiian boys sang native songs to the accompaniment of banjo and guitar. Even the Japanese, of whom there are many, took part in the parade, and a special prize for uniqueness of design went to one car, owned, decorated and operated by a Japanese.

Automobiling in the islands is progressing rapidly. Much credit is

side the harbor, sometime about 2 o'clock in the morning. I heard the spanker boom come down as we shortened sail, and knew we were almost at our destination. When it became light I was on deck, and I never shall forget the fragrance of that tropical



A WHITE STEAMER PRIZE WINNER.



C. W. CHAPIN'S BOAT-LIKE SECOND PRIZE WINNER.

and runabouts the third. The celebration was not confined to the American residents of Honolulu. The Hawaiians themselves

their number is constantly on the increase.

When I was here before, coming from San Francisco on a schooner, we lay to, out-

due in this respect to the Von Hamm-Young Company, Ltd., the pioneer automobile dealers of the islands and agents for the White car. The Island of Oahu, on which Honolulu is situated, is well adapted to automobiling. Beautiful roads lead in many directions, and a trip around the island is an easy and pleasant matter. Automobiles have

come here to stay, and

atmosphere as the morning breeze bore it out to us over the waters of the harbor. We were ashore at breakfast time, and, after spending the day wandering about, we heard there was to be a concert by the Hawaiian Band that evening at Kapiolani Park. Tired as we were, two of us went to the park, and, when we reached there, stretched ourselves full length under the trees, listening to the music, the soothing Hawaiian music. Through half closed eyes we watched the incandescent electric lights glimmer among the feathery foliage of the trees overhead; watched the moonlight filter down to meet the lower lights; watched the strange features of natives coming and going; and so we spent the warm summer evening, thinking we were in an enchanted world, care-free and living only in the absorbing, luxuriant present.



ALBERT AFONG'S ILIMA

TRIMMED WINTON, ONE OF THE MOST ARTISTIC IN THE PARADE.

Patents

Non-skid Rivets.

No. 814,798.—H. P. Palin, of North Attleboro, Mass.

Rivets having a thin, flat head inside and a conical burr 3 outside. The rivet stem



PALIN METAL NON-SKID RIVETS.

7 is upset and fills a conical hole in the burr, preventing the latter from pulling off when it wears down.

Safety Steering Gear.

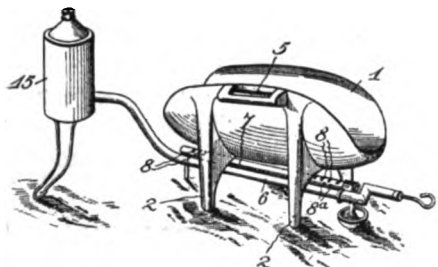
No. 814,586.—E. D. Cahen, of Paris, France.

The safety arrangement in this patent consists of duplicating everything between the steering shaft and the wheels—including the worms, worm wheels, bell-cranks, drag links, and cross links, between the knuckles, so that if one part breaks the duplicate will remain in service.

Vulcanizer.

No. 815,209.—J. M. Padgett, of Topeka, Kan.

A portable vulcanizer designed for roadside application to a tire on the wheel. The body is an aluminum casting 1, resting on legs and provided with a recess for hold-



PADGETT PORTABLE VULCANIZER.

ing a thermometer 5. It is shaped to receive the base of a tire, and is heated by a small burner 6, 7, resembling that of a steam vehicle. The gasoline coming from the can 15 is vaporized in the tube 6 and issues from a nozzle into the mixing tube 7, burning as it issues from slits 8 8. A few lateral slits 8a supply the flames that keep 6 hot for vaporization.

Body Construction.

Nos. 814,823 and 814,824.—H. E. Bradner, of Lansing, Mich.

These patents relate to different methods of using hard sheet fiber as a substitute for wood veneer in body construction. By the first patent the fiber is used without wood support, and is steamed and bent to shape and attached to the body skeleton like thin wood panels. By the second patent a thin sheet of fiber is used as a veneer over several thicknesses of wood glued together with the grain crossing, as in the regular styles of bodies. In either case the merit

of the fiber is stated to be that it does not check, warp, or crack, nor does it buckle or vibrate like sheet metal.

Air-cooling Device.

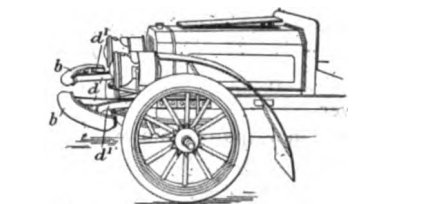
No. 815,257.—C. H. Blomstrom, of Detroit, Mich.

Integral cast flanges of the usual sort, with long threaded rods of small section screwed into holes tapped from top to bottom through the flanges, intersecting them all. The purpose is to increase the effective convecting surface.

Buffer.

No. 814,171.—F. R. Simms, of London, Eng.

A safety buffer to protect the front wheels from shocks. The face of it is an



SIMMS PNEUMATIC BUFFER.

air cushion *b* in the shape of a section of a pneumatic tire, and the framework *d u'* may take the form of a spring of any desired shape.

Speed-changing Mechanism.

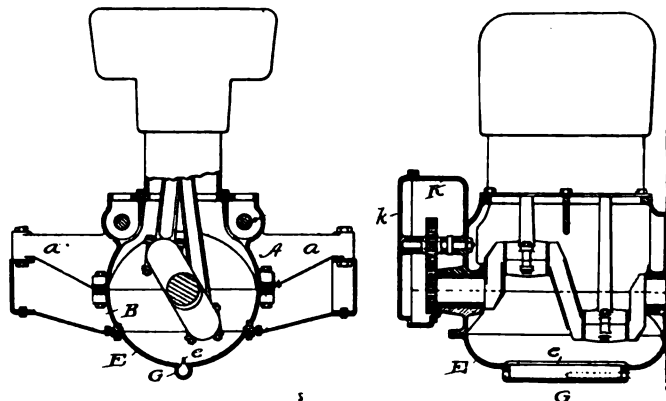
No. 814,133.—H. S. Hele-Shaw, of Liverpool, Eng.

A planetary transmission using Hele-Shaw clutches in place of the usual clutch and friction bands.

Pneumatic Tire.

No. 815,109.—F. Veith, of Höchst-in-Odenwald, Germany.

A tire having a shoe of the form shown, to fit into the rim illustrated, and having the inner tube molded so that when deflated



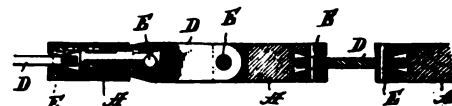
SCHMIDT DIVIDED CRANKCASE DESIGN.

it will assume the collapsed section shown. The purpose is to protect the inner tube from damage by the tire tools when putting on or removing the shoe.

Flexible Shaft.

No. 815,240.—A. P. Warner and C. H. Warner, of Beloit, Wis.

A shaft formed of sections jointed together as shown. The round sections *AA*



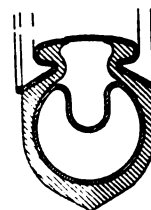
WARNER FLEXIBLE SHAFT.

are connected by flat links *DD* at right angles to each other. To increase the flexibility, the pins *EE* are smaller than the holes in the links, thus permitting universal motion of the links on the pins.

Crankcase Design.

No. 815,045.—C. Schmidt, of Cleveland, Ohio.

Instead of making the whole lower half of the crankcase an oil pan, and supporting the crankshaft independently of it by bolted caps forming the bottom halves of the main bearings, the crankcase is divided horizontally into three portions, *A, B* and *E*, of which the first carries the supporting wings *a*, the second supports the crankshaft, and the third forms the oil pan. Preferably a four-cylinder engine has two oil pans *E*,



VIETCH PNEUMATIC TIRE.

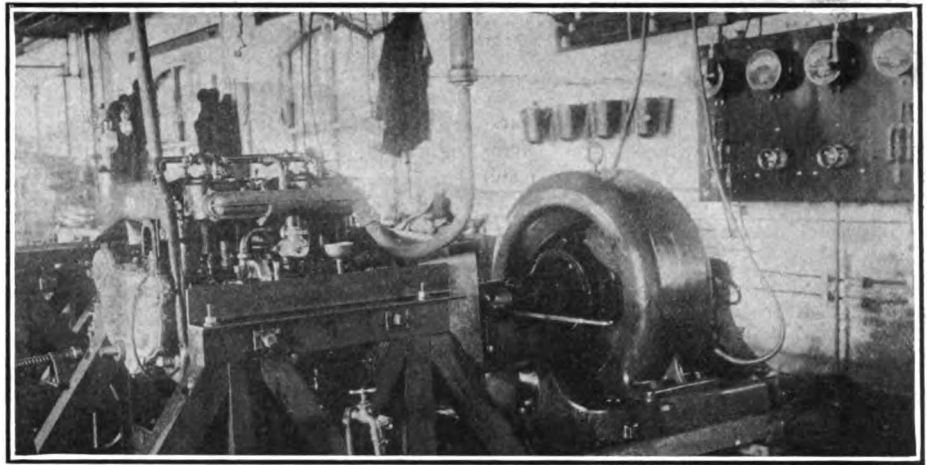
one for each pair of cylinders, thus reducing the labor when only one needs to be removed. At the base of each oil pan is a pocket *G*, with a plugged hole at each end, the intention being that this pocket shall collect the sediment from the oil, which shall then be removable by the use of a plunger forced through *G*. Just above is a

baffle bar *e*, which helps to guide sediment into *G*, and also checks the movement of oil due to the motion of the cranks. The form of the gear housing *K k* is clearly shown.

Testing Locomobile Motors.

An interesting part of the extensive plant of the Locomobile Company of America, at Bridgeport, Conn., is the motor testing department, through which each motor passes before being placed in a car. Each motor is required to drive a dynamo at a speed sufficient to generate a current which represents the expenditure of a predetermined horsepower. The engraving shows a 30-35-horsepower motor mounted on the testing stand and coupled to the dynamo, ready for testing. An ammeter, a volt meter, and the necessary switches are mounted on the switchboard; a double set of instruments is seen, there being a second testing stand just beyond the one shown in the engraving, so that two 30-35-horsepower motors can be tested at one time.

After being assembled, each motor is placed on a stand (not the testing stand) and is flooded with oil and run by belt for some time in order to get the working parts somewhat "limbered up." It is then placed on the testing stand and the regular carbureter, ignition apparatus with low-tension magneto, the circulating pump and other accessories attached. When all is ready, the motor is cranked in the usual way and is allowed to run for some time idle. Then it is engaged with the dynamo by means of a cone clutch of the ordinary type used on the Locomobile cars, and at this point the test proper commences. The volt meter, ammeter and revolution counter are employed and the readings noted as the motor runs, slowly at first, but gradually increasing in speed as the throttle is opened, until maximum power is developed. If a motor fails to develop its full rated power, it is sent back and is not passed until it can come up to the required output; but the manufacturers state that this is rarely necessary, the motors almost invariably testing well above their rated horsepower. The power is calculated by



TESTING PLANT FOR LOCOMOBILE ENGINES, SHOWING DYNAMO AND METERS.

multiplying the amperage and voltage and dividing by the known constant of the dynamo, the resulting figures being the horsepower.

The 15-20-horsepower motors are tested on a similar stand. There are two stands for the larger motors and one for the smaller size. Testing is done by a special crew, composed of men who have nothing to do with the assembling of the motors.

Brennan Vertical Motor.

A four-cylinder vertical motor embodying a number of interesting features has recently been brought out by the Brennan Mfg. Co., of Syracuse, N. Y., a concern that has for a long time made a specialty of horizontal motors. The new four-cylinder motor is made in five sizes, 20, 28, 32, 45 and 80 horsepower, all built on the same lines and differing only in point of size.

Generally speaking, the engine is of the familiar four-cylinder vertical water-cooled type, with individual cylinders, integral heads and water jackets and the valves mechanically operated. The valve arrange-

ment differs somewhat from the usual type.

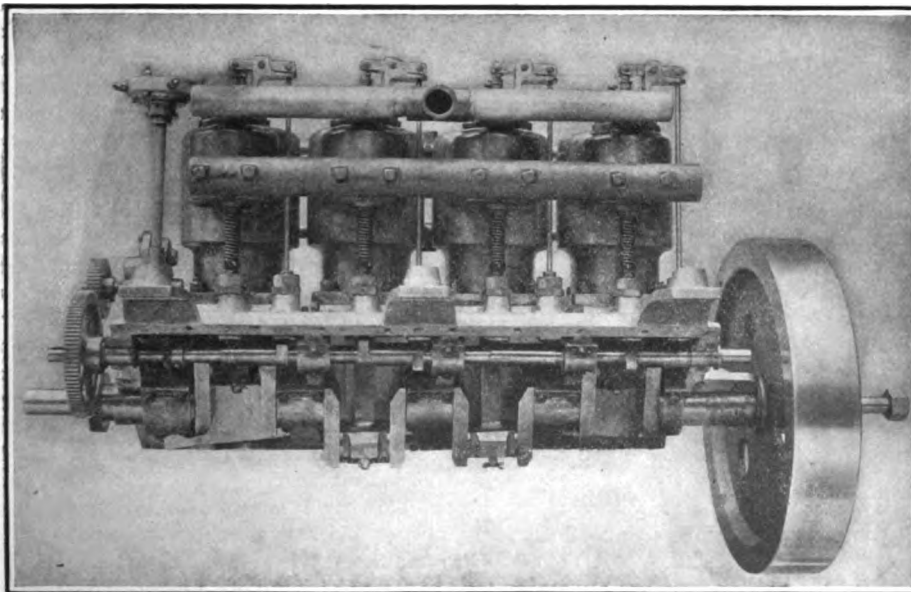
The exhaust valves are at the sides of the cylinders and the inlet valves are on top, opening through the cylinder heads, being operated by rocker arms which, in turn, are moved by long push-rods extending upward from the crankcase. The camshaft runs in five bearings inside the crankcase and the two cams for each cylinder are made integral with a sleeve which is placed on the camshaft and secured in position. Thus there is no chance for the cams to shift with relation to each other.

The crankcase differs from the usual form in being divided diagonally at an angle of forty degrees. When the lower half, which, as usual, serves for an oil chamber, is removed, the crankshaft, camshaft and big end bearings are easily reached for adjustment or inspection, remaining attached to the stationary upper half of the case. The timer is mounted on a vertical shaft at the front end of the motor, and is driven by bevel gears from the camshaft, these gears being in the crankcase, where they are protected from dust and accidental damage and at the same time are well lubricated by splash.

The crankshaft has five bearings and is made, the manufacturers state, from a solid billet of 40-point carbon steel, 3 1-2 per cent. nickel; the flywheel is bolted to a flange formed integral with the shaft. Connecting rods are of forged steel of I-beam section and the bearings at each end are of bronze.

Sliding gear transmissions are made by the Brennan Co. in various sizes to suit these motors, the supporting arms being machined so that when mounted on a sub-frame the transmission will be exactly in line with the engine. The gears are of 1-inch face and 6 pitch and are hardened in oil. Drive is direct on the high speed, when there are no gears in operation.

Automobile railway cars have been adopted by the state of Bavaria for use in secondary lines, and, although these have been in use only since February 1, they have already proved their efficiency.



BRENNAN VERTICAL FOUR-CYLINDER ENGINE, MADE IN SIZES FROM 20 TO 80 HORSEPOWER.

Automobile Companies Recently Incorporated.

Merchants' Garage Company, Wawarsing, N. Y.; capital stock, \$50,000. Directors, P. S. Hill, F. M. Van Wagonen and C. H. Clark, New York.

National Lubricant Company, New York City; capital stock, \$100,000. Directors, Edward Moroney, J. J. Klein, Brooklyn, and W. C. Rosenberg, New York.

Aeronaut Publishing Company, New York City; capital stock, \$100,000. Directors, George Bennett, A. C. Camp, New York City, and H. O. Bingham, Oradell, N. J.

White Motor Company, Camden, N. J.; capital stock, \$150,000. Incorporators, James W. White, Charles F. Woodhull and Charles S. King.

Goodyear Rubber Tire Company of New York; capital, \$1,000. Directors, K. B. Harwood, L. L. Lewis and P. W. Williamson, New York.

Automobile Station of San Antonio (Texas); capital stock, \$1,000. Incorporators, A. E. Staacke, J. W. Collins and E. W. Heusinger.

Wisconsin Auto Transit Company, Milwaukee; capital stock, \$15,000. Incorporators, William C. Sieker, Kenneth E. Heaty and Ernest Von Briesen.

August Schubert Gear Company, Oneida, N. Y.; capital stock, \$25,000. Directors, August Schubert, J. O. Schubert and S. F. White, Oneida.

Toledo Auto Touring Company, Toledo, O.; capital stock, \$15,000. Incorporators, Frank J. Van Loo, James Sheehan, U. G. Denman, Carl A. Hudson and Louis E. Krieger.

Rhode Island Machine Company, Providence, R. I.; capital stock, \$20,000; to manufacture automobile engines, gears and appliances. Organizers, Walter M. Jordan, Edwin G. Pinkham and Clayton Harris, Providence.

King Manufacturing and Garage Company, Springfield, Ohio; capital stock, \$20,000, of which \$500 is in 8 per cent. preferred stock.

Mora Motor Car Company of Newark, N. Y.; capital stock, \$150,000. Directors, Samuel H. Mora and William Freeman, of Rochester, William H. Birdsell, of Newark, and George S. Whitney, of Akron, O.

Chemical Auto Co. of Cleveland (Ohio); capital, \$25,000. Incorporators, D. E. Marpass, E. G. Whitten, A. F. Neitt, J. M. Gee and Elijah Bates.

Automobile Exchange, Chicago; capital, \$25,000. Incorporators, Frank Schoenfeld, Milton L. Thackberry and Emil F. Link.

Illinois Motor Roadway Co., Centralia, Ill.; capital, \$150,000; to maintain an automobile roadway. Incorporators, L. A. Johnson, W. Rollin Smith and F. B. Miller.

Snutsel Auto Supply Company, New York; capital \$5,000. Directors: H. L. Snutsel, J. C. Hoffman, Rudolph Weinacht.

Automobile Maintenance Company of America, New York; to manufacture automobiles, etc.; capital \$200,000. Incorporators: Frank Van Orden, William Wieck, Joseph M. Ayer.

Powell Muffler & Timer Company, Utica, N. Y.; to manufacture mufflers, timers, and cut-out valves for automobiles, marine and stationary engines; capital \$5,100. Incorporators: Wm. S. Foster, Wm. B. Foster, John J. Radell, George A. Bowman, Herbert S. Powell.

Racine Boat Manufacturing Company, New York; to manufacture motors, engines, boilers, boats, etc.; capital \$5,000. Incorporators: Oscar Grieff, John Krauch, Walter Gregg, J. Harvey McCracken, Walter J. Reynolds.

Eagle Automobile Company, Rahway, N. J.; capital \$60,000. Incorporators: Frank G. Van Dewater and A. Grobby Spencer.

Mutual Auto Accessories Company of America, New York; capital \$10,000. Directors: T. B. Nisbet, S. A. Houck, F. J. Wallace.

Manly Drive Company, Jersey City, N. J.; capital \$200,000. Incorporators: A. H. Overman, T. M. Roulette, F. J. Lockman. The company is to purchase automobile letters patent.

Kirchdorfer Automobile Company, Louisville, Ky.; capital \$20,000. Incorporators: J. C. Kirchdorfer, Edward Kimmel, F. S. Clark.

Woodill Auto Company, Los Angeles, Cal.; capital, \$25,000. Directors: Gilbert, A. G., H. B. and A. L. Woodill and Arthur Wright.

American Gasoline Motor Company, Baldwinsville, N. Y.; manufacture gasoline motors, boats, etc.; capital, \$20,000. Incorporators: D. Sweet, H. Hendrickson, W. A. Hendrickson, J. E. Carthart, W. B. Harris.

Motor Vehicle Company, Buffalo, N. Y.; capital, \$20,000; to make and sell motor vehicles. Incorporators: James McNaughton, Louis DuBroy and M. D. Ashford.

Stoddard-Dayton Auto Company, Chicago; capital, \$5,000; garage. Incorporators: W. E. Harvey, H. L. Babcock, A. S. Joslin.

The Auto Shop Company, Cleveland, O.; capital, \$50,000. Incorporators: C. F. Schroeder, I. B. Sperry, W. C. Schroeder, M. W. Lusk, A. L. Maurer.

St. Anne Kerosene Motor Company, St. Anne, Ill.; capital, \$100,000; manufacturing motors. Incorporators: B. H. Pomeroy, A. Sutton, W. A. Quertim.

Hyde Park Garage, Chicago; capital, \$2,500; storage and repairing. Incorporators: T. J. Holmes, G. A. McWhinney, C. E. Moore.

Downtown Garage and Automobile Repair Company, New York; capital, \$10,000.

Directors: E. R. Geddes, F. M. Raynor, Alva Collins.

Endurance Motor Car Company, New York; capital, \$35,000. Directors: Harold Mabie, H. W. Johns, A. Parker Smith.

W. J. Duane & Co., New York; to manufacture motors; capital, \$5,000. Directors: W. J. Duane, F. A. Phillips, A. Y. Pringle.

New York Motor Truck Company, New York; capital, \$85,000. Directors: N. W. Schlater, J. W. Deane, William Donover.

Auto Livery & Sales Co., Cleveland, O.; capital, \$25,000. Incorporators: W. H. Marlott, H. H. Carr, J. E. Hull, Christian Gill and Chas. E. Carpenter.

Automobile Maintenance Co., Laporte, Ind.; capital, \$5,000. Incorporators: John Wolf, Alex E. Lindgren and Martin Weber.

ELASTIC WHEEL FOR SOLID TIRE.

DAYTON, O., March 26.—C. C. Wilson, of this city, has been granted a patent for an improved automobile wheel, upon which a solid tire may be used, it is claimed, with the same satisfaction as a pneumatic tire. The rim of the wheel on which the tire is supported is made of a series of hinged segments pivoted to a series of spokes which set against springs in the hub and afford a resilient and elastic rim. The new tire will do away with punctures and blow-outs. Mr. Wilson has been experimenting for a year.

FARM IMPLEMENTS AND AUTOS.

AURORA, ILL., March 26.—Gen. Andrew Welch, one of the veteran agricultural implement dealers of the Fox river valley, has taken the agency for two automobiles, the Cadillac and the Studebaker.

There is considerable significance in the fact. General Welch likes sporting events and always when there is any kind of a race or contest in the valley he is at the head of it.

It is almost certain that he will promote some sort of competition to show the great and increasing interest in automobiles, and his influence is sure to counteract some of the prejudice that the farming fraternity have against the power vehicle.

MAKING THE ELDREDGE.

BELVIDERE, ILL., March 26.—The National Sewing Machine Company, of this place, is making an automobile on which there has been no change of any kind in three years. The machine is of the runabout type and weighs 1,200 pounds. The company has distributed 300 of them to different parts of the country, last week shipping two carloads to Buffalo. Fifty machines will be made this year.

This car is known as the Eldredge, is a two-cylinder, two-cycle, 10-horsepower. Its transmission is of the sliding gear mechanism, has three speeds forward and reverse. One of the Eldredges now in the shop has traveled over 20,000 miles.

GARAGE CHARGES INCREASING.

At its next meeting the New York Automobile Trade Association, embracing about forty of the leading dealers in the metropolis, will discuss and act upon the question of increasing the charges for storing and cleaning cars. It is thought that the rates will be increased 10 or 15 per cent. The present minimum rates, as fixed by the Association, are as follows:

Runabouts, \$20; for small tonneau cars, \$22.50; for ordinary touring cars, \$25; for large touring cars, \$27.50, and for limousine or closed cars, \$30. These prices include storage, washing, and polishing of the car. Gasoline and all repairs are extra.

Some of the biggest dealers, who have erected costly garages on Broadway, have already found it necessary to raise these rates independently of the action of other agents, owing to the heavy cost of maintenance of their establishments.

"Storage rates would probably be gradually advanced this season," said the manager of one garage, "without the action of the Trade Association. Apart from the heavy expenses that the occupants of the new buildings have to meet, good garages are scarce, and good men, who are careful of a car, are hard to find. It seems a simple matter to wash and polish a car, but it is really a skillful piece of work. With our large cars, it takes a man fully three hours to wash the car, rub it dry, and then go over it with a chamols. If the work is poorly done, the varnish will soon crack and the high polish will lose its luster. Good washers get from \$14 to \$16 a week, and if a car is used every day and needs three hours of attention, that takes off quite a slice of the profits in storing a car at \$25 a month."

AUCTION SALE IN INDIANAPOLIS.

Indianapolis, March 19.—The Indiana Automobile Company introduced an innovation, so far as Indianapolis is concerned, last week, in the way of an automobile auction sale. Although little more than an experiment, it was successful. The company had in stock half a dozen second-hand electric vehicles that had been traded in on 1906 models of the various cars for which the company is agent. To get rid of them quickly, Manager S. W. Elston decided to auction them off.

Attracted by the novelty, probably 100 persons gathered in the garage, and before the afternoon was over, people who had not before thought of owning an automobile were the owners of electric cars. Bidding was lively but prices for the most part were low. One car went under the hammer for \$110, while another sold for \$300, the highest price realized. The average price for which the cars sold was about \$250.

Other concerns that have their garages crowded with second-hand cars for which they have no use, will probably follow the example of the Indiana company.

KANSAS CITY TRADE EXCELLENT.

Kansas City, Mo., March 26.—Trade is excellent. Among the early purchasers of Ford runabouts are a number of men who have large cars for pleasure but want small ones to use in a business way. This alone shows the development of the city in an automobile way, for the possession of more than one car was very rare even last year. This year, however, it promises to be no unusual thing.

One of the runabout purchasers is the Kansas City Gas Company, which controls both natural and manufactured gas in Kansas City. The car is to be given a thorough trial by the company's inspectors, with the probability that more will be put

into service if the first proves satisfactory. In this the gas company is following the lead of the electric light company, which has for some time been using a Kansas City car for runs in cases of accident to electric light wires. The street railway company still use horse-drawn wagons because of the heavy equipment required by the wrecking crew. Other business concerns are said to be ready to be convinced as to the merits of the runabout for their city salesmen and the like.

One of the most interesting performances of large cars here is that of the Pierce, owned by Mrs. D'Estaing Dickerson. It was purchased last June and its owner has made it a point to cover 1,000 miles each month. The record was maintained up to the end of February, without the car ever going in to the repair shop or having any other attention than that of the chauffeur. Replacements consisted of one pair of foot brake shoes and six tires, although the car had been driven 8,000 miles up to March 1. Mrs. Dickerson also owns a Clement limousine, which was, at the time of its purchase, the most expensive car in the city.

THE QUAKER CITY TRADE.

Philadelphia, March 26.—The latest addition to the rapidly-growing local garage list is the Chestnut Hill garage, lately opened under the management of A. Allan, on Highland avenue, Chestnut Hill. Besides carrying on a general automobile hiring, repairing and storing business, Mr. Allan has secured the Germantown and Chestnut Hill agency for the Cadillac, Autocar and Marmon cars.

The Colonial Auto Company, at Fifteenth and Oxford streets, is greatly enlarging its new garage, which has already proved quite inadequate to take care of the rapidly-growing business.

The local home of the Cleveland and Jackson cars, the garage and salesrooms of the Diamond Motor Car Company, on Broad street above Diamond, is undergoing a number of alterations, among which is the installation of a large charging plant for electric vehicles.

GARAGE WIPED OUT BY FIRE.

Rochester, N. Y., March 26.—Fire wiped out the garage of the Thompson-Schoeff Company on Plymouth avenue, this city, last week, causing a loss of \$75,000. The entire building, in which there were thirty or more automobiles stored at the time, was completely gutted, and all but six of the machines were destroyed, as was also a large stock of carriages, sleighs, harness, etc., that was stored in the structure. The building was well insured, and the contents partly so. Major Francis V. Schoeffel, the head of the firm, says that preparations were in progress for the opening of the spring business when the fire occurred, and there were many absolutely new cars in the building, worth from \$1,500 to \$4,000 each. The origin of the fire is unknown.

CHICAGO DEALERS ELECT OFFICERS.

Chicago, March 26.—The annual meeting of the Chicago Automobile Dealers' Association was held at the New Southern hotel last week and officers were elected for the coming year as follows:

President, Ralph Temple; vice-president, Orlando F. Weber; secretary, James Levy; treasurer, Joseph Gunther; directors, the officers, and H. Paulman, Fred Pardee, and Walter L. Githens.

This organization was formed last winter for the purpose of promoting the interests of the dealers in Chicago.

PITTSBURG DEALERS ORGANIZE.

Pittsburg, March 26.—An important step in automobile history in Pittsburg is the organization of the automobile dealers into an association to promote their mutual interests. It will be known as the Association of Automobile Dealers of Pittsburg, and will be operative April 1. Officers have been elected as follows: President, W. N. Murray, of the Standard Automobile Company; vice-president, W. A. Richwine, of the Hilland Automobile Company; secretary and treasurer, Arthur L. Banker, of Banker Brothers.

The dealers, in forming their association, have fixed a uniform rate for garage storage, as follows: \$5 a week for runabouts, \$6 a week for touring cars, and \$7 a week for cars with limousine bodies. The new association will also protect the dealers' interests against manufacturers, who have recently been quite arbitrary in their demands, such as requiring a large deposit in October for the next year's deliveries, and fixing the number of cars which a dealer must take. Uniformity in price of supplies will also be fixed by the new association.

Among the firms enrolled already are the Banker Brothers Company, Standard Automobile Company, Keystone Automobile Company, East Liberty Automobile Company, Hilland Automobile Company, Winton Motor Car Company, and Atlas Automobile Company.

When the garages now being erected are completed Pittsburg will have storage room for many more cars than are owned here. The new garage of the Atlas company will hold 500 cars. The Fort Pitt Automobile Company can store 150 cars, the Hilland 300, the Standard 100, and Banker Brothers Company 100.

LEAR TO MOVE TO ZANESVILLE.

Columbus, O., March 26.—In consideration of a bonus of \$100,000, most of which is cash, the Oscar Lear Automobile Company, of this city, has accepted a proposition to remove its plant to Zanesville, this state, 60 miles southeast from here, and engage in the business on a larger scale. The city has agreed to furnish the company a site of ten acres of fine manufacturing land, and in addition buy bonds to be issued by the company.

President Lear says the company plans to move in the fall, or by the first of the year. Work on the new buildings will start as soon as the weather permits. The present capital stock of \$30,000 will be increased to \$150,000. The company now employs in the neighborhood of 100 men and will have to double that number when the new plant is completed. Last year nearly 100 machines were turned out, and this year between 150 and 200 will be made. The entire output for the year has been contracted for. The company will soon begin making a commercial vehicle in addition to its line of Frayer-Miller cars, which will be equipped with the well-known air-cooling device that is characteristic of the factory's productions.

The Columbus Buggy Company, which last year entered into the manufacture of electric vehicles, expects to turn out 200 machines this year—more than double last year's output.

Flourishing is the term to use in describing the condition of the trade in Columbus, and it promises to become a leading industry of the Buckeye state capital. Its progress the past two years is a sufficient augury of this.

The Keystone Automobile Company has about completed its new offices and show rooms in its East End garage which will be one of the finest in the city of Pittsburg.

News and Trade Miscellany.

The Wayne garage, at 33 Grant square, Brooklyn, recently established, is one of the busiest of the Brooklyn agencies.

Mrs. Joan Newton Cuneo, who drove in the Glidden tour and has been seen on several racetracks, has purchased a Maxwell Speedster, which she will in future drive on private tours and in beach and track races. She will enter her car in the 1906 Glidden tour.

The Auto Supply Co. has opened a branch at 2208 Broadway, between Seventy-eighth and Seventy-ninth streets. The main store at Broadway and Fifty-first street will be continued, the branch being necessitated by the growth of the firm's business in the uptown section.

The low speed of the Sunset two-cycle car was given as 2 1-2 miles an hour in the description of that machine published in our issue for March 8. Writing from the office in San Francisco, Manager D. Libby, Jr., states that this should have read fourteen miles an hour.

Roy D. Chapin, the former sales manager of the Olds Motor Works, is at the present time touring in California. Upon his return to Detroit it is understood that he will go into the manufacture of automobiles, and associated with him will be Mr. Coffin, who was the head designer of the Olds company.

The Cadillac Company, of New York, has removed from Thirty-eighth street, near Broadway, where it has been located for the last three years, to its new building at Broadway and Sixty-eighth street. The building has four floors, affording 36,000 square feet of floor space. The basement will be reserved for Cadillac delivery wagons.

Charles E. Miller, the well-known dealer in automobile supplies, has opened three new stores recently; one in New York City, at 924 Eighth avenue, within a short distance of the new clubhouse of the Automobile Club of America, now being erected; one in Detroit, Mich., at 227-229 Jefferson avenue, and one in Buffalo at 824 Main street.

Having made arrangements to handle the Mitchell pleasure cars in addition to the Mitchell trucks and delivery wagons, the Mitchell Commercial Vehicle Company has removed from the Auto Arcade, Forty-ninth street and Broadway, to 121 West Thirty-first street, and Mitchell interests in New York City are now centered under one roof.

Joy Bros., of St. Paul, Minn., have placed orders for four large gasoline trucks of the Packard type for use in St. Paul. They have also placed an order for a 20-passenger sight-seeing bus, to be used by the St. Paul park board for Como Park. It is expected in the near future that the Commercial Club of St. Paul will establish a sight-seeing service.

In describing the Mora 24-horsepower car in THE AUTOMOBILE for March 22 the address of the company manufacturing the machine was omitted, through a regrettable error. The Mora car is built by the Mora Motor Car Co., whose offices are at 318 Livingston Building, Rochester, N. Y. The car has been styled the Mora Roadster by the builders.

L. M. Dieterich, whose name is familiar to readers of THE AUTOMOBILE as a valued contributor on technical subjects, has accepted the position of chief engineer and

factory manager with the Aerocar Company, of Detroit. This company builds the air-cooled Aerocar. Mr. Dieterich has made a special study of air cooling for automobile motors and will give the company the benefit of his investigations.

Fred H. Bogart, who has been identified with the Corbin Motor Vehicle Corporation, New Britain, Conn., since its inception, as mechanical engineer, severs his connection with that house on April 1, to head a new automobile parts manufacturing concern which is being organized at Hartford, Conn. Mr. Bogart will continue, however, to act in an advisory capacity for the Corbin plant.

The Automobile Cover and Top Mfg. Co., Inc., of New York, is moving into larger quarters at 154 East Fifty-seventh street, New York, where it will have the use of about 20,000 square feet of floor space. Departments will be opened for body building, painting, and upholstering. Messrs. Fichling and Spinning have recently purchased the interests of Percy Owen and Robert E. Fulton in the company.

The National Automobile Company, 205 East Eighty-sixth street, New York, has been placed in the hands of Robert A. Inch as receiver in bankruptcy by Judge Adams, of the United States Circuit Court, upon application by the Columbia Lubricants Company and others. It is stated that the sheriff is in possession of the place. The assets amount to about \$5,000, and there are a number of cars in storage belonging to other persons.

The Rainier Company has found a location for its Philadelphia branch, having just taken possession of the premises at 236 North Broad street, formerly occupied by the La Roche Automobile Company. This office will be under the management of A. J. Picard, well known as a starter in various race meets, and who achieved a considerable reputation as a driver several years ago in the first 1,000-mile non-stop run between New York and Boston.

The Knox Motor Truck Company, of Springfield, Mass., is now breaking ground for a large addition to its present works. A two-story brick building 200 by 50 feet, with basement, will be erected adjoining the present plant. Two models of trucks will be built, one for the hauling of heavy goods, the other a sight-seeing car carrying fifteen to twenty-five passengers. Walter Morse, formerly president of the Second National Bank, of Springfield, has been appointed president of the Knox Motor Truck Co., to succeed C. J. Wetsel. The capital stock has been increased from \$150,000 to \$250,000.

A new brick building, 47x200 feet, is now being erected by the Locomobile Company as an addition to the factory at Bridgeport, Conn. In this building the carpenter shop, pattern room, department of polishing, plating and buffing, and sheet metal department will be located. A new drop hammer has been installed at the works, thus doubling the facilities in that department. Up to the present time every Locomobile shipped this year has been delivered on time.

In order to ascertain the actual strength of its automobile jacks, the Covert Mfg. Co., of West Troy, N. Y., had crucial tests made recently by Prof. T. R. Lawson, engineer in charge of tests at the testing laboratory of the Rensselaer Polytechnic

Institute of the city of Troy, N. Y. The result was far beyond anticipations. The No. 1 jack, weighing only 6 pounds, and the No. 2 jack, weighing only 8 pounds, withstood each a pressure of over 20,000 pounds, and the No. 3 jack, weighing but 12 pounds, withstood a pressure of over 30,000 pounds.

Automobile bodies of every description will be produced by the Bridgeport Vehicle Company, a corporation recently organized with a capital stock of \$50,000 at Bridgeport, Conn. A building containing 30,000 square feet of floor space, fully equipped with up-to-date machinery, has been leased, and the company is prepared to fill orders. The officials of the corporation are: H. D. Miller, president and treasurer; H. F. Brandes, vice-president; Geo. C. Miller, secretary; A. W. Knapp, superintendent.

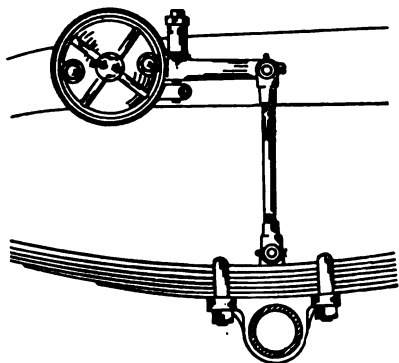
Word has just been received of the winning by an American automobile of the biggest track race ever held in Australia, with the distinction of being the first American car to win any speed event there. This race was for the J. R. Croke cup, valued at \$500, the most valuable prize ever offered for an automobile race in the Southern Hemisphere. The race was a three-mile handicap, and the Pope-Hartford ran away with the event, this 10-horsepower car making faster time than most of the 16-horsepower cars entered. The Continental Tire Company presented the winner with a gold medal.

C. A. Coey, Chicago agent for the Thomas, has just moved into his new store and garage. The garage proper is considered as complete as it is possible for one to be. The huge room has a concrete floor, which slopes toward two channels running to the rear of the building. All water used in washing the machines and drippings from the cars run over the concrete floor to these channels and are carried away. Each car stored in the place is kept in a separate compartment, the keys of which are held by the man in charge of the garage and the driver of the car. Every time the car is taken from the place a registration is made of the fact, and the time of its return is also noted down. A record of this is given to the owner at whatever intervals he wishes. The Coey garage is dry and well lighted, almost the entire roof being of glass.

The Trader Handbook and Diary, published by the Cycle Trade Publishing Company, 21 Wilson street, London, England, is a unique work and one that is of great convenience to the persons in the trade. It is, of course, intended for use in Great Britain and consequently much of the information contained in it is of no practical value to residents of foreign countries; but it is quite the most convenient book of the sort published. The diary portion of the book is ruled for three days to a page and interleaved with blotting paper. The page measures about 8 by 12 inches. In addition there are ruled pages for insurance records, sales or hire of machines, rentals, repairs, identification marks, and index to customers. The work is published in two separate editions, one for manufacturers and the other for retailers. The manufacturers edition contains a list of dealers in England, Scotland and Ireland that would be very valuable to any American manufacturer desiring to circularize the trade and it also contains a telegraphic code adapted to the requirements of the cycle and automobile trade. This edition costs twenty shillings and sixpence. Firms engaged in trade with England should find the work especially useful.

INFORMATION FOR BUYERS.

SHOCK ABSORBER.—The Victory shock absorber illustrated herewith is made by the Hill Motor Car Co., of Haverhill, Mass. The construction is such that the device offers four times as much resistance to the



VICTORY SHOCK ABSORBER ATTACHED.

recoil of the car spring as it does to the compression, making the rebound slow, with the result that the car rides easily on rough roads. Once fitted to a car the Victory absorber requires no further adjustment.

AUTO TRUNKS.—Several styles of trunks made especially for side-entrance touring cars are illustrated by halftones from photographs in a little catalogue issued by Sage's Trunk Depot, Summer and Kingston streets, Boston, Mass. Among them are special trunks made especially for Pierce Arrow, Mercedes, Packard, Darracq, White, Peerless, Winton, Reo, and Cadillac cars. They are made to fit the cars and to be carried on a rack at the rear or taken off and used in traveling. They are made of patent leather on a steel frame, hand-stitched and riveted, and are guaranteed to be dust and waterproof.

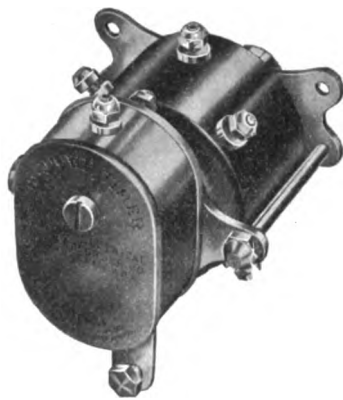
AUTO TOPS.—Cape tops, canopy tops, Victoria tops, limousine bodies, and various fittings for bodies are some of the specialties made by the Teel Mfg. Co., Inc., of Medford, Mass. The Cape tops are all custom made and fitted to the car; they are light and can be put on and taken off with little labor. Clumsy lines are avoided. Various coverings are used, such as khaki, whipcord, leather, imitation leather, and pantasote. The company makes its own cloths. With each top is a complete equipment of curtains and boots for protection against wind, rain, and dust. A specialty which the company is offering for this season is the Teel rolling front, which has a window of celluloid and standards of brass. When in use this front is strong and affords protection to the driver from wind and rain, and when not in use it rolls down to the top of the dash and the standards fold down on top of it. The Teel line includes, in addition to the foregoing, a line of trunk racks, trunks, straps, tire irons, tire covers, sprag drops, and metal boxes for tools, luggage, and ice.

PUNCTURE-PROOF TIRE.—A non-puncturable pneumatic tire is being exploited under the name Elder by the patentee, James M. Elder, of Indianapolis. This comprises a single-tube air chamber strengthened by two or three plies of fabric and resting on a steel rim between two concave rolled steel bands that conform to the shape of the air chamber and cover about one-third of the tread. These steel bands are screwed or bolted to the sides of the felly at their inner edges and have their peripheries

folded back in such a way as to form a retaining channel for a solid rubber tread which fits over and rests upon the periphery of the air tube. This solid tread is very thick and prevents any injury to the air tube underneath, while the steel bands protect the sides of the tube against rim cutting or other damage. The solid tread has endless retaining wires embedded in its edges and is made slightly smaller in internal diameter than the tread of the air chamber, so that when the latter is inflated the solid tread will not creep.

FUEL REGISTERING PUMP.—The Boyer, Radford & Gordon Tank & Pump Co., of Detroit, Mich., has produced a novel gasoline pump that can be attached to any receptacle or tank. The pump has a sort of cyclometer device which registers the quantity of fuel taken from the tank, four strokes to the gallon. A second register, which can be reset to zero, registers any specific quantity taken out at one time. Thus a dealer is always aware of the quantity of gasoline used and the amount that still remains in the tank. A return drip with check valve carries the overflow back into the tank and at the same time acts as a vent to release air and gases, and consequently explosions are avoided.

TIMER AND DISTRIBUTOR.—A single coil, non-vibrator timer, made in two sizes, for single-cylinder engines and for two, three, and four-cylinder motors, is made by the Monitor Speed Recorder Co., 274 Pearl street, Cambridge, Mass. It is marketed under the name McQuown Timer and Distributer. The contact is effected automatically by make-and-break mechanism, giving a very sudden contact which makes it practical for one coil to do the work of four coils with the ordinary timer. The instantaneous contact also prevents the coil from overwork due to long contacts. In the McQuown timer the length of contact can be adjusted to a nicety. If the contact is just long enough to actuate the coil, a still coil is declared to give the best results, one still coil doing the work of four vibrating coils, the same advantages applying with equal force when the timer is used in connection with a low-tension magneto. The timer illustrated will not stop with the contacts together, so there is no waste of batteries due to the circuit being closed while the engine is stopped, nor will it reverse, causing the engine to give several backward revolutions. As it makes and breaks contact automat-



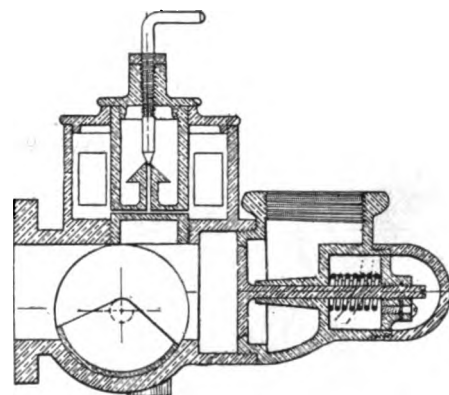
MCQUOWN TIMER AND DISTRIBUTER.

ically, an instantaneous contact is secured however slowly the engine is running, which facilitates starting and economizes battery current. By means of a push but-

ton on the dash the starting spark can be given. The timer can be secured to the engine frame and connected direct to the secondary shaft, or by means of suitable connections can be mounted on the dash. The timer mechanism is carried in a tight case in front of and connected to the distributor.

The Monitor Speed Recorder Co. also makes the Monitor speed registering instrument for use on automobiles, auto-boats, steamships, and railroad trains. The speed-indicating device is operated electrically by means of make-and-break mechanism, while a cyclometer registers the mileage and a dial revolved by clockwork receives the permanent record of the speed and miles traveled.

AUTOMATIC CARBURETER.—Flexibility is the chief characteristic of superiority claimed for the new Palmbra carbureter, which the North Chicago Machine Co., of North Chicago, Ill., is manufacturing and offering in the market. The construction of the carbureter is shown in the cross

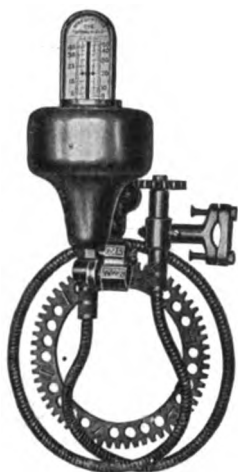


PALMBRA AUTOMATIC CARBURETER.

section drawing herewith. It has an annular float carried in a chamber surrounding the needle valve. Below is a throttle formed in the arc of a circle cutting off the air in the intake. At the right is a supplementary automatic valve which can be regulated by changing the tension on the coil spring. The makers assert that this carbureter is sufficiently flexible to allow it to meet the requirements of the convertible two or four-cycle motor in which, when changing from one cycle to the other, the fuel consumption in an instant is doubled or reduced one-half.

SPRINGFIELD SPEED INDICATOR.—The speed indicating instrument shown on the next page is the result of the efforts of the R. H. Smith Mfg. Co., of Springfield, Mass., to produce a durable and reliable instrument at a comparatively low price. As the illustration shows, the pointer rises and falls vertically over a scale of miles; for high-powered cars the scale is made to read to 80 miles an hour, while for less speedy cars the scale reads to 50 miles an hour. The principle of the centrifugal governor is made use of in the operating mechanism, and the instrument is gear-driven through a flexible shaft from a gear attached to one of the front wheels of the car. The bracket on the steering knuckle is adjustable to any American car. If a pebble or other hard object gets between the gears no harm will be done, as the gears will merely be forced aside, and will automatically return to mesh when the obstruction is out of the way. The indicating instrument is mounted on the dashboard by a

bracket which permits it to be set at any angle. Bearings are of steel and are automatically lubricated; the manufacturers state that every moving part is balanced. The case and trimmings are of phosphor bronze, and the case is water and dust proof.



SPRINGFIELD SPEED INDICATOR.

A feature that should be useful is that the dial is luminous, so that it can be read in the dark without a special light. The Springfield speed indicator may be had with or without an odometer.

AUTO SPECIALTIES.—A line of metal articles for automobile use is made by the

Dover Stamping and Manufacturing Company, 385 Putnam avenue, Cambridge, Mass. Among these is the funnel shown in the engraving herewith. It is provided with a fine mesh brass strainer near the small end and has a remarkable metal hoop, indicated by dotted lines, which sets on top above a piece of chamois skin, which it holds in place while the gasoline tank is being filled. The funnel is made in five sizes, from one pint to two gallon capacity, and coppered to prevent rusting. The fluted nozzle al-



DOVER FUEL STRAINING FUNNEL.

lows the gasoline to run into the tank quickly while the air escapes around the outside of the nozzle. Another specialty made by this company is a heavy galvanized steel drip pan to be placed on the floor of the garage under the car to catch all dripping gasoline and lubricating oil. These have their edges turned over a heavy iron rod that is bent around the corners, so that

there are no sharp edges or corners to injure the tires. They are made in two sizes—35 by 47 inches for runabouts and 35 by 95 inches for touring cars.

CLEANING LIQUID.—La-Lo is the name of a cleaning and polishing preparation sold by the Constant Company, 1024 Boylston street, Boston, Mass., for use on wood, metal, and leather surfaces, and also as a dust layer for floors. It is claimed for the preparation that it will clean and soften leather seats and cushions, and prevent them from hardening and cracking from exposure. Besides removing dirt and grease from woodwork and restoring the luster, it is said to prevent corrosion, rust, and tarnishing of metal that is cleaned and polished with it.

NEW TRADE PUBLICATIONS

THE HEATH Co., Saratoga Springs, N. Y. —An eight-page leaflet containing a dialogue on the features, action, and merits of the Heath dry gas carbureter, which is also illustrated.

HOLSMAN AUTOMOBILE Co., Monadnock Bldg., Chicago.—Catalogue of the Holzman automobiles, which are built on buggy lines and driven by gasoline motors through flexible steel cables. Full details of the machine are given.

COLUMBIA LUBRICANTS COMPANY OF NEW YORK, 78 Bond street, New York City.—Calendar for 1906 showing map of Vanderbilt cup race course for 1905 surrounded by halftone reproductions of the trophy and portraits of the donor and the winner.

INDEX TO ADVERTISERS

Acetylene Gas Illuminating Co.....	37
Acme Motor Car Co.....	80
Add-Wear Tire Sleeve Co.....	69
Aerocar Co.....	80
Am. Anti-Puncture Tire and Auto Co.....	48
American Ball Bearing Co.....	44
American Battery Co.....	46
American Coil Co.....	37
American Generator Co.....	46
American Machine Mfg. Co.....	40
American Shock Absorber Co.....	75
Anderson Forge & Machine Co.....	40
Archer & Co.....	37
Aster Co., L.....	64
Atwood Mfg. Co.....	37
Auburn Automobile Co.....	79
Audel & Co., Theo.....	41
Auto Pump Co.....	38
Auto Rebuilding Co.....	57
Auto Safety Starting Crank Works.....	40
Auto Top and Equipment Co.....	64
Automobile Equipment Co.....	39
Automobile Supply Co.....	38
Badger Brass Mfg. Co.....	50
Baker Motor Vehicle Co.....	80
Baldwin Chain Mfg. Co.....	49
Bates Forge Co.....	37
Bemus, T. Alton.....	53
Bentley, Joseph.....	39
Beverly Mfg. Co.....	40
Boker & Co., H.....	37
Boston Mechanical Co.....	41
Bowser & Co., S. F.....	59
Brasier Mfg. Co., M. E.....	39
Briscoe Mfg. Co.....	40
Brown Talbot Machine Co.....	46
Brownell-Trebert Co.....	42
Buckeye Jack Mfg. Co.....	60
Buckeye Mfg. Co.....	81
Bullard, J. H.....	45
Buob & Scheu.....	39
Byrne-Kingston Co.....	56
C. B. & Q. Ry. Co.....	38
Cadillac Motor Car Co.....	90
Capitol Foundry Co.....	40
Carbondale Chemical Co.....	37
Carlisle Johnson Machine Co.....	Cover
Carr, S. F.....	39
Central Body Co.....	76
Central Garage.....	38
Champion Co., Albert.....	36
Champion Mfg. Co.....	38
Chandlee & Chandlee.....	57
Chase & Co., L. C.....	47

Chelsea Clock Co.....	36
Cleveland-Canton Spring Co.....	53
Coates Clipper Mfg. Co.....	59
Collins & Sons, G. A.....	39
Connecticut Tel. & Electric Co.....	63
Continental Caoutchouc Co.....	70
Continental Motor Mfg. Co.....	38
Coops Co., C. W.....	39
Corbin Motor Vehicle Corporation.....	89
Corwin Mfg. Co.....	Cover
Covert Mfg. Co.....	38
Crawford Automobile Co.....	79
Crucible Steel Casting Co.....	40
Cullman Wheel Co.....	40
Daimler Mfg. Co.....	85
Dayton Electrical Mfg. Co.....	87
Dayton Motor Car Co.....	85
Deere-Clark Motor Co.....	76
Diamond Chain & Mfg. Co.....	37
Diamond Rubber Co.....	70
Dietz, R. E.....	55
Diezemann Shock Absorber.....	61
Dixon Crucible Co., Joseph.....	43
Dolson Automobile Co.....	83
Dorris Motor Car Co.....	79
Douglass Andrews Co.....	49
Dover Stamping & Mfg. Co.....	38
Dow Portable Electric Co.....	37
Duquesne Construction Co.....	37
E. H. V. Co., The.....	80
Eclipse Buggy Co.....	39
Edmunds & Jones Mfg. Co.....	37
Elbridge Electrical Mfg. Co.....	51
Eldredge Electric Mfg. Co.....	36
Electric Rubber Mfg. Co.....	58
Electric Vehicle Co.....	81
Elmore Mfg. Co.....	87
English Daimler Co.....	75
English & Mersick Co.....	Cover
Erle Railway.....	64
Excelsior Supply Co.....	36
Fairmount Engineering Works.....	38
Firestone Tire & Rubber Co.....	74
Ford Motor Co.....	87
Franklin Mfg. Co., H. H.....	91
Franklin Portable Crane & Hoist Co.....	41
G & J Tire Co.....	73 and Cover
Garage Equipment Co.....	41
Garford Co., The.....	47
General Electric Co.....	61
Gibbs-Brower Co.....	46
Gibson House.....	64
Gilbert Mfg. Co.....	42
Glover, George E.....	38
Goodrich Co., B. F.....	Cover
Goodyear Tire & Rubber Co.....	72
Gramlich Chemical Co.....	61
Ham Mfg. Co.....	54
Hardy Co., The R. E.....	37

Harris Oil Co., A. W.....	50
Harrison Wagon Co.....	36
Hartford Machine Screw Co.....	40
Hartford Rubber Works.....	71
Hartford Suspension Co.....	84
Hatcher Auto Parts Co.....	53
Havemeyer Oil Co.....	36
Hawkins Mfg. Co.....	43
Haynes Automobile Co.....	88
Healy Leather Tire Co.....	52
Heinze Electric Co.....	58
Henry, Chester C.....	75
Hicks Speed Indicator Co.....	56
Hoffecker Speed and Mile Register Co.....	48
Hoffman, George W.....	37
Holley Bros. Co.....	63
Hopson & Chapin Mfg. Co., The.....	40
Hotchkiss, P. M.....	66
Hydraulic Oil Storage & Distributing Co.....	38
Imperial Brass Mfg. Co.....	46
Iroquois Motor Car Co.....	79
Janney, Steinmetz & Co.....	37
Jeffery & Co., Thomas B.....	90
Jersey Brake Co.....	47
Jones Speedometer.....	53
Kent Mfg. Works Co., Atwater.....	36
Kilgore Auto Air Cushion Co.....	56
Kirkman Motor Mfg. Co.....	45
Knox Automobile Co.....	82
Lafayette Hotel.....	61
Lipman, C. E.....	40
Lobe Pump Co.....	40
Locke & Co.....	44
Locomobile Co. of America, The.....	88
Logan Construction Co.....	45
London Auto Supply Co.....	39
Loomis Autocar Co.....	36
Loring, E. J.....	44
Lozier Motor Co.....	95
Manhattan Lamp Works.....	55
Manley, Chas. H.....	52
Manning Mfg. Co.....	39
Manufacturers Motor Car Co.....	44
Matheson Motor Car Co.....	83
McCord Mfg. Co.....	38
McDonald, Wessels & Ames Co.....	40
Mezger, C. A.....	68
Merritt Co.....	39
Meyer, C. G.....	39
Miami Pattern Works.....	37
Michellin Products Selling Co.....	72
Michigan Top Co.....	37
Midgley Mfg. Co.....	40
Miller, Charles E.....	51
Milwaukee Steel Foundry Co.....	49
Mitchell Motor Car Co.....	78
Moline Automobile Co.....	78
Monitor Speed Recorder Co.....	47
Mora Motor Car Co.....	76
More-Power Co.....	36
Morgan, B.....	59

THE AUTOMOBILE

VOL. XIV.

NEW YORK—THURSDAY, APRIL 19, 1906—CHICAGO

No. 16

MONACO MOTOR BOAT MEETING A GREAT SUCCESS.

MONTE CARLO, April 10.—A fleet of sixty-six motor boats furnished by France, Italy, England, Germany and Switzerland were gathered together in the magnificent enclosure on the Condamine when the Prince of Monaco the other day opened the third annual motor boat exhibition. The exhibition ground is the one known to visitors to previous Monaco meetings, admirably fitted with lifts and traveling cranes and stepways to the water's edge, where all the boats are exposed in the open air, with the steep cliffs of the town as a background and the blue waters of the Mediterranean in the fore. In numbers, quality of the craft and attendance of visitors the two previous meetings were easily beaten.

It is estimated that the boats gathered together in the bay represented a value of \$400,000, and the estimate is certainly not

exaggerated, for never has more care been bestowed on the construction and finish of motor boats—if one can so designate craft measuring between fifty and sixty feet, weighing six or seven tons and carrying motors of 600 horsepower. One craft alone, the Mercedes-Paris, is valued at \$16,000.

The most striking feature of the meeting was the enormous advance made by Italian constructors, some of the finest boats on exhibition coming from across the Alps. French sportsmen who had formerly feared England as a competitor are now of opinion that their Latin cousins will set the pace—and a hot pace it will be.

Naturally the racers attracted most attention, and there were, indeed, some splendid boats among the fourteen craft entered in the three racing divisions. Four boats were shown in the



MONACO HARBOR, SHOWING LAUNDRY

THE CRADLE.



FIRST TRIAL OF THE "QUICKSILVER" AT ANTIBES.

26-foot class, all of them of French construction except Baron de Cater's *Seasick*, which has been engined by Itala. The craft were: *Antoinette IV*, hull by Pitre, engines by Levavasseur; *La Rapière II*, hull by Fellier & Gerard, engines by Panhard-Levassor; *Vol au Vent*, built by Pitre, engined by Hotchkiss; *Seasick*, built by Tellier, engined by Itala. *Antoinette IV* is a boat that will be watched with much interest. She has a sixteen-cylinder Levavasseur engine, and is fitted with two rudders, one to the left and the other to the right of the propeller. Trials made on the Seine before sending the boat south proved that the double rudder caused her to answer very quickly to the helm.

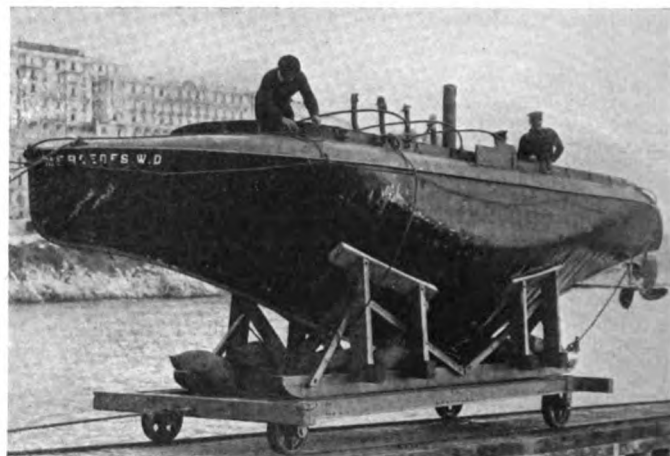
In the 39-foot section there was a more international display. S. F. Edge entered his *Yarrow Napier* driven by two six-cylinder motors of 140 horsepower each. Lionel de Rothschild had a new Napier boat, the *Siola*, with an almost flat-bottomed wooden hull built by Saunders and six-cylinder motor by Napier. The *Cafit*, owned by Vincenzo Florio, built by Tellier & Gerard and engined by Itala, attracted considerable attention by reason of her two four-cylinder motors of 120 horsepower each, mounted side by side. The two motors form one group, but are at the same time independent, each one having its carbureter, its magneto, and its oil and water pumps. The two, however, are mounted on the same crankcase, the crankshafts being distant from one another 45 centimeters. The cylinders are of 180 mm. bore.

Fiat XIII, entirely of Italian construction, was another exceptionally fine boat. She has a large beam and much greater freeboard than has hitherto been found in this class of boat. Her propeller is only of moderate size, but the pitch is very deep. In her recent trials she traveled at more than 31 miles an hour. In the third series for boats of 39 to 59 feet four representa-

tives were found. One of the French favorites is the 45-foot *Dubonnet*, last year's champion. The hull, built by Tellier, remains untouched except for a little strengthening here and there. The 300-horsepower Delahaye motor which attracted much attention at the last Salon, merely on account of its enormous size, was found too heavy for such a hull, and has been replaced by two four-cylinder De Dietrich motors in tandem. A clutch unites the two motors, allowing the second to be started and afterwards connecting the first up to it.

The *Mercedes W. D.* is the most curious craft of the exhibition, the hull being designed on the lines of a one-rater sailing vessel. As a sea boat she gives excellent results, but even M. Jellinek-Mercedes admits that she does not come up to expectations in the matter of speed; and when the King of Sweden stopped to look more closely at her unusual lines the owner declared with a smile that she was the "calculation of an engineer." The French element interpreted it "miscalculation," and while ridiculing the design expressed surprise that the Mercedes concern should risk the chances of a splendid motor to such a hull. Another Mercedes craft entered in the same category is the *Mercedes D. L.*, with a steel hull, carrying a six-cylinder motor, but too heavily built. The largest was the *Delahaye*, 59 feet long.

In the matter of propellers this year there is no uniformity, though the two-blade type, numerous last year, has entirely dis-



"MERCEDES W. D." IN HER CRADLE ON THE WAYS.

appeared. The French have adopted a huge hub with comparatively small blades and not too much thrust, while the Italians have frequently long-bladed propellers, fantastically finished off at the end. The *Florentia III*, one of the fastest cruisers, is fitted with a very small propeller, while the Italian racer *Cafit* on the other hand has double propellers of large area and different shape. A departure has been made from orthodox lines in the placing of the rudder, both the Panhard boat *Rapière* and Baron de Cater's *Seasick* having it fixed at one side of the stern, slightly in advance of the propeller. M. Tellier claims that the action of the screw on the rudder is thus lessened and steering is easier.

Disaster has not been long in falling on the Monaco meet, two auto boats having already been destroyed. *Fiat XIV* and the *Rapide*, two Italian cruisers of 24 and 16 horsepower respectively, were being towed to Monaco when under the influence of the gale they broke loose and went ashore. The Fiat motor is intact, but the hull is reduced to matchwood. The auto-yacht, *Quand Même*, the only survivor of the trans-Mediterranean race, also had a narrow escape from being driven on to the rocks.

A. C. A. APPOINTS FOREIGN ATTORNEY.

Members of the Automobile Club of America have been notified that the club has appointed Major F. A. Mahan, 51 Avenue Montaigne, Paris, to act as attorney for the club in France. Members touring in Europe may apply, if the necessity arises, to Major Mahan for legal advice and assistance, for which he will charge a reasonable fee.



GENERAL VIEW OF MONACO AUTO BOAT EXHIBIT.

FUNCTIONS OF VALVES IN FOUR-CYCLE MOTORS.

In the internal combustion automobile motor the original source of energy is the inflammable gas, composed of a mixture of vaporized gasoline and ordinary air, which is usually formed outside the working cylinder, in the carbureter. The explosion of this gas, upon ignition, releases the energy which imparts the power impulses to the piston and, by the interposition of the connecting rod, produces the rotary motion of the crankshaft. It is evident that the gas or charge must be admitted to the cylinder at predetermined intervals, confined therein while burning, and when it has done its work or become spent must be permitted to escape to the atmosphere to make way for a succeeding incoming charge. In the four-cycle motor, which is the type here referred to, these duties fall upon the inlet and exhaust valves which, actuated by the moving parts of the engine itself, open and close at fixed intervals with relation to the movements of the piston.

In order to show the arrangement and operation of the valves of a modern four-cycle gasoline motor, the drawing, Fig. 1, may be referred to. This shows a typical form of four-cycle engine—that is, an engine in which an explosion occurs at every fourth stroke of the piston, or every second revolution of the crankshaft—with valves of the type commonly called “mechanically operated” valves. A valve of this type is normally held tightly on its seat by a spring, and is opened at the proper time by a cam which raises a rod, known as a push-rod, which in turn presses upward on the lower end of the valve stem and so opens the valve. The exhaust valves are always opened by a cam or equivalent device, but a different method is frequently adopted for opening the inlet or admission valve. This will be explained later.

The cams that lift the valves must perform their functions at exactly correct and regular intervals with relation to the speed of the crankshaft; otherwise the motor will run irregularly or not at all. In a four-cycle motor of the type illustrated the cycle of operations commences with the first downward stroke of the piston. At the commencement of this stroke the admission valve must open, and it must remain open throughout the downward stroke to permit gas from the carburetor to be drawn into the cylinder by the suction of the piston. At the end of this suction stroke, during which the exhaust valve has remained closed, the cylinder is filled with gas. If the piston now commenced its upward stroke with the admission valve still open, the gas would, of course, be driven back through the open valve and into the atmosphere through the carburetor; but at the instant the piston finishes its downward stroke and (having drawn as much gas as possible into the cylinder) is about to commence the up stroke, the admission valve closes and remains closed while the piston makes the up stroke, and the exhaust valve also remains closed.

We now have the piston moving upward in a cylinder in which it is an air-tight fit, two valves closed, and also air-tight, and no other means of communication with the atmosphere. Under these conditions the gas is necessarily compressed into a space called the “combustion chamber,” practically an upward continuation of the cylinder bore, which, together with the passages leading to the valves, is sufficiently large to accommodate the gas at a predetermined pressure. When the piston reaches the top of its compression stroke and the gas is occupying the smallest space allowed by the design of the engine, the spark is made and explosion occurs about the time the piston commences to move downward for the second time. The ignited gas continues to expand as the piston descends, the pressure continuing to the bottom of the “power stroke,” as it is frequently called. During the expansion of the gases both valves remain closed, as on the compression stroke. At the end of this stroke the exhaust valve opens the only time during the cycle, allows the escape of spent gases which are of no further use, and would, if allowed to remain in the cylinder, retard or altogether prevent the next

upward stroke of the piston. The piston goes up with the exhaust valve open and the admission valve, of course, still closed; the burned gases pass out through the exhaust valve.

When the piston reaches the top of the exhaust stroke—the fourth and last stroke of the cycle—and can push no more gas out through the valve, the exhaust valve closes. There still remains in the upper part of the cylinder and in the valve passages a certain amount of burned gas. This dilutes, to a certain extent, the next incoming charge of combustible gas, and though this is an undesirable feature, it is usually considered less disadvantageous than any of the methods that have been devised with a view to ridding the cylinder of the burned gas.

After the exhaust stroke the piston starts again on a suction stroke with inlet valve open and exhaust valve closed, and this is followed again by the compression stroke with both valves closed, by the power stroke or explosion stroke with both valves closed, and by the exhaust stroke, with the exhaust valve open and the inlet valve closed, and so on, repeating the cycle as long as the engine runs.

As has already been stated, the inlet valves of some motors are not opened by the cam arrangement shown in Fig. 1, but are opened against the pressure of a spring by the suction of the piston on the intake stroke; or, more properly speaking, by the pressure of the atmosphere outside of the cylinder when the piston creates a partial vacuum in the cylinder. Such an inlet valve is

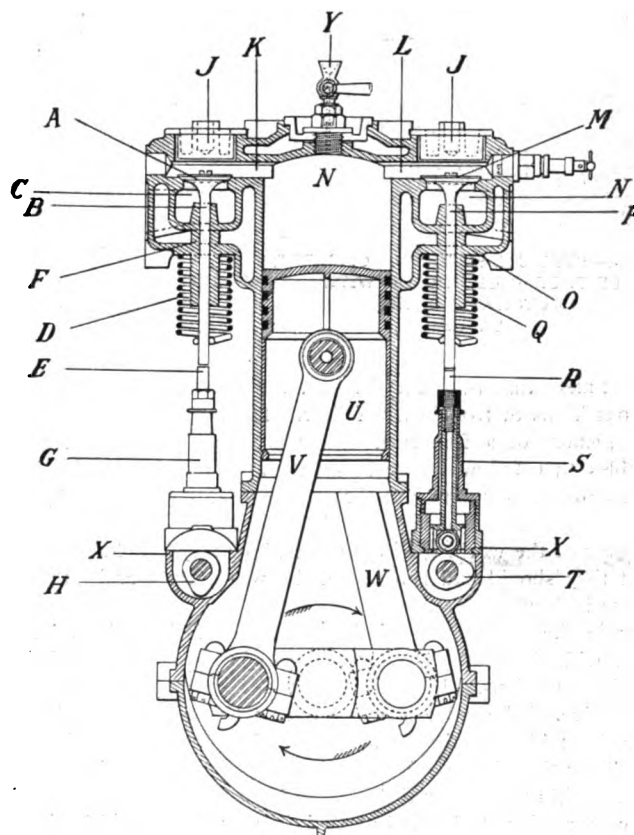


FIG. 1.—VERTICAL SECTION OF TYPICAL FOUR-CYCLE MOTOR WITH MECHANICALLY OPERATED VALVES.

A, exhaust valve. B, exhaust valve stem. F, exhaust valve stem guide. D, exhaust valve cam. E, exhaust valve push-rod. H, exhaust valve bushing. C, chamber communicating with inlet pipe. K, exhaust passage. M, inlet valve. P, inlet valve stem. O, inlet valve spring. Q, inlet valve cam. R, push-rod guide in section showing bushing, and screw and nut on top of rod for taking up wear. N, chamber communicating with inlet pipe from carburetor. L, inlet passage. J, J, plugs in openings through which valves may be removed. Y, compression relief cock. N, combustion chamber. XX, casings covering cam and lower ends of push-rods. Section of casing on inlet side shows roller on lower end of push-rod riding on cam and mounted in hollow square which forms lower end of push-rod. U, piston. V, W, connecting rods.

shown in Fig. 2, and is called an "automatic" valve. It will be seen that the pressure existing in the cylinder during every stroke except the intake stroke tends to keep the inlet valve closed; the spring is brought into active use only for closing the valve promptly at the end of the suction stroke. On the compression stroke the inlet valve is kept closed by the pressure of the charge; the pressure of the burning gas on the power stroke keeps the valves closed; and on the exhaust stroke, even though the exhaust valve is wide open, there is sufficient pressure to keep the inlet valve tight even if the spring was absent.

During the suction stroke the exhaust valve is prevented from opening by the fact that its spring is considerably stronger than that of the inlet valve and holds the valve firmly on its seat, notwithstanding the suction of the piston. During the compression and the explosion strokes the exhaust valve is naturally kept close on its seat by the pressure within the cylinder, as is the inlet valve; but at the end of the explosion stroke it must be opened by the cam against heavy pressure. Therefore the exhaust valve must always be mechanically opened.

If the valves are not made to open and close at exactly the

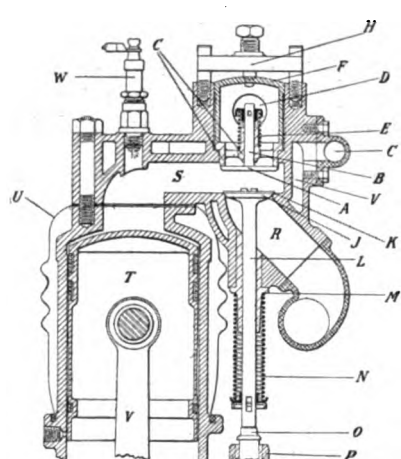


FIG. 2.—VERTICAL SECTION OF CYLINDER OF FOUR-CYCLE MOTOR WITH AUTOMATIC INLET VALVE.

A, inlet valve. B, inlet valve stem. C, inlet valve seat and stem guide cast integral. F, inlet valve chamber held in place by yoke H and set-screw. The removal of this chamber permits the removal of valve and seat. D, opening communicating with pipe from carbureter. E, inlet valve spring. J, exhaust valve. L, exhaust valve stem. M, exhaust valve stem guide. N, exhaust valve spring. O, top of exhaust valve push-rod. P, top of push-rod guide. R, passage communicating with exhaust pipe. S, passage for incoming gas and outgoing exhaust. T, piston. V, water space. G, water inlet. W, spark plug. U, connecting rod. H, yoke. In this motor the head containing valves is a separate casting bolted to cylinder.

right times—that is, if they are not correctly "timed" or "set"—various kinds of trouble will follow. The simplicity of the valve arrangement of a four-cycle motor is rather deceptive, for the troubles that follow incorrect timing are sometimes difficult to trace up, and sometimes the conditions are complicated by the presence of more than one disturbing factor. A thorough understanding of the working of the valves, how they should work and what they should and should not do, will greatly assist the beginner in locating his own valve troubles.

As in the explanation of the functions of the valves, let us begin with the intake stroke and see what consequences follow certain conditions. In the case of the mechanically operated inlet valve, if the valve is set to open too late in the stroke the time for taking in the charge of combustible gas will be curtailed, for though the valve remains open for the usual period of time, it will not close until the piston has commenced to ascend on the compression stroke, and part of the new charge will be forced back through the still open inlet valve into the carbureter. And the comparatively high degree of vacuum that is created before the valve opens causes the gas to enter with a sudden rush that is very apt to be disturbing to the carbureter. Under these conditions the engine will develop less than its normal power, owing to scanty charges and low compression, and the carbureter will give trouble.

In the case of an automatic inlet valve, late opening, with the same results, will be caused by a spring that is too strong; only in this case the valve will also close too early, so that the latter part of the stroke will have a tendency to reduce the pressure

of the charge below atmospheric—that is, to produce a slight vacuum—and the atmospheric pressure must be restored on the upward or compression stroke before normal compression can commence.

If the mechanically operated inlet valve commences to open too early the result will very soon be apparent. As the intake stroke follows immediately after the exhaust stroke, the too early opening of the inlet valve, occurring while incandescent gases are filling the upper part of the cylinder at a pressure that is still considerable, will permit some of these gases to pass through the inlet valve and ignite the gas in the pipe leading from the carbureter, causing what is known as "popping" in the carbureter. The burned gas is then drawn into the cylinder with the combustible gas, giving a weak mixture, difficult to ignite and incapable of exerting sufficient pressure, when it is ignited, to enable the engine to develop its rated power. If, as is most likely to be the case, the early opening is followed by an early closing, the charge will be cut down still further and compression will be low. With a mechanically opened inlet valve the valve is necessarily held open for the same period of time, whether the opening commences late or early, the time being fixed by the contour of the cam.

Automatic inlet valves are not subject to too early opening, because, even if the spring is weak, the pressure of the exhaust will keep the valve closed until the piston has descended far enough on the suction stroke to create a partial vacuum, when there will be no possibility of any flow of gas out through the inlet valve. If the spring is too weak the inlet valve will, if not stopped mechanically, open too far and at the end of the suction stroke the spring will not be able to close the valve until the upward stroke has commenced; thus part of the charge will be forced back through the inlet valve and the compression will be low and the explosion weak.

The period during which the exhaust valve remains open is fixed, as is the case with the mechanical inlet valve, so that early opening means early closing, and late opening late closing. If the valve opens too soon the pressure on the piston is relieved before the useful part of the stroke of the piston is over. The early closing will result in the retention in the cylinder of burning gases under a pressure which is slightly increased by the compression caused by the upward movement of the piston. Now, if the inlet valve is mechanically operated, it will open while there is hot gas in the cylinder under pressure, and there will be a flow of the residue of the exhaust out through the inlet valve.

If the exhaust valve is late in opening the piston will have to commence its upward stroke against an exceedingly heavy pressure, and this, of course, reduces by just so much the useful power developed in the motor. The late closing of the exhaust valve will result in some of the burning gas being drawn back into the cylinder at the same time that the new charge is entering by the inlet valve. In extreme cases this may cause pre-ignition and burning back in the carbureter; and in any case, the dilution of the new charge of gas will result in reduced power.

The speed of the engine—that is, the number of revolutions per minute—has an important influence on the valve operation. In a very fast running engine with an automatic inlet valve, the valve spring must be stronger than would be necessary for a slow running engine; for the valve must close rapidly and promptly. In actual practice, the exhaust valve is set to open a trifle before the explosion stroke is completed in order to give as much time as possible for the escape of the exhaust gas and to ensure a pressure not above atmosphere in the cylinder when the exhaust valve closes and the inlet valve opens. The inlet valve commences to open the instant the exhaust valve is seated, but no earlier, in order to avoid the escape of exhaust gas through the inlet valve, as already mentioned. With automatic inlet valves the exhaust cannot blow back into the carbureter. A mechanically operated inlet valve is usually set to close just at the end of the suction stroke.

PABLO BEACH HAS RACING, BUT NO RECORDS.

JACKSONVILLE, FLA., April 14.—Pablo Beach has been introduced, found desirable, and will be the scene of future speed automobile competitions. But even the most energetic work of William J. Morgan could not induce the high-powered flyers to make a second journey to Florida at this time. There was racing, some of it decidedly interesting to the participants at least, but the day is past when the general public sits up and takes much interest in touring-car events.

The Pablo course has width, hardness, and, from the view standpoint, is most excellent. From the lawn of the Hotel Continental, or from the long bridge which extends far out over the course and into the ocean, it is possible to have a grand view up and down the beach, of which six miles were used in the racing, though thirty miles are available. In the opinion of the experts, Pablo may not be quite as fast as Ormond, though it is not as shelly, is dryer, and possesses the same hardness as the stretch of sand further down the coast. It is possible to make the journey between Jacksonville and St. Augustine entirely on the beach, the journey from the latter place being of scarcely an hour's duration.

An incident of the meet that excited considerable though regrettable discussion involved Promoter Morgan and President Charles A. Clark, of the Jacksonville Automobile and Motor

Lamper, who did 5:08, defeating Mr. Adriance, of Poughkeepsie, by a half minute. Both gentlemen took part in the gymkana sports with the Hon. William Jones, of Macon, Ga., owner of a 20-horsepower Franklin, and others. Mr. Jones spoiled two tires and was out of everything. But his blood was fired, and he says

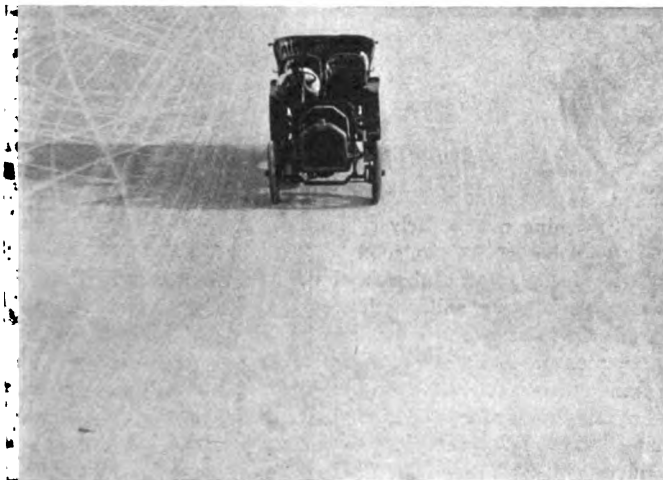


VIEW OF CONTINENTAL HOTEL AT PABLO BEACH.

he will have an American racing car for the Vanderbilt Cup race. In the water-carrying gymkana race Miss Dorothy Meyers won first honors, greatly to her own amusement and that of her father.

Thomas Flyer Started from Scratch.

The final race of Thursday brought sensations. Seven cars started with the 50-horsepower stripped touring Thomas flyer of Charles Creelman, of Atlanta, driven by J. A. Lander in the absence of Mr. Creelman, from scratch. Just after starting Lander ran over a big dog, which he killed. The accident cost him the race, as at the finish he was but seventeen seconds back of Charles F. Wheeler, of St. Augustine, in his 1905 Peerless. Lander was last two miles from the finish and haled down his field in the most sensational manner. Every advance was a battle royal for him, and he gained second by but a second over Mr.



J. A. LAMPER, 30-H.P. PEERLESS, MILE IN 1:43-5.

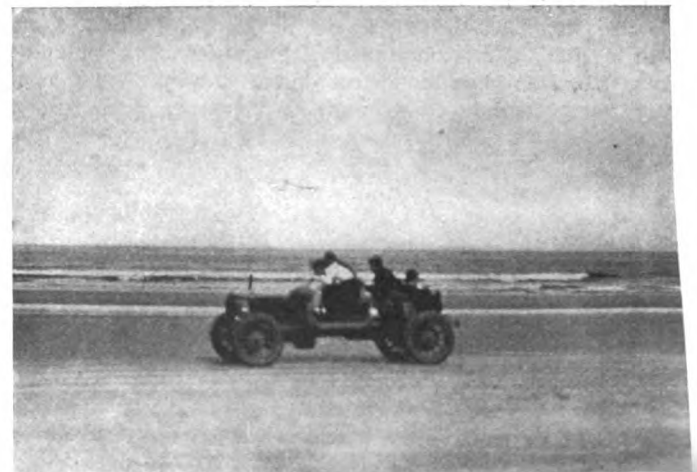
Boat Club. Mr. Morgan considered that he was not receiving proper support from the club and could not resist the temptation to append a facetious remark and then post a telegram which told of the inability of the president to be present. The latter wrote a letter that was hardly fit to print, and Mr. Morgan retaliated with one that invited his opponent to a fistic argument. There was talk of pistols and seconds, but wiser counsel may bury the affair. Alex Schwalbach, who did the handicapping, resented some criticism by Secretary Herbert Race, and once more the peacemakers had an opportunity of keeping the belligerents apart.

A Peerless Winner on Tuesday.

The times of the touring cars on Tuesday, the opening day of the meet, proved conclusively the speed of the beach, for J. A. Lamper, of Lynn, Mass., in his 30-horsepower Peerless, won a three-mile match race from William Adriance, Jr., of Poughkeepsie, N. Y., who drove his 20-horsepower Stevens-Duryea in 3:42. Mr. Adriance was beaten but one-fifth of a second. Later Mr. Lamper won the ten-mile handicap from scratch in 12:07.

Lamper Won Again on Wednesday.

Wednesday's races consisted of gymkana games and the five-mile championship of Florida. This event was won



J. A. LANDER, 50-H.P. THOMAS, RECORD MILE :57 2-5.

Lamper in the 30-horsepower 1906 Peerless, with Mr. Adriance the 20-horsepower Stevens-Duryea third, and Mr. Jones the 20-horsepower Franklin. The Thomas Flyer was the winner had a handicap of 2:50; Lamper had the Adriance a minute, while Jones had 1:45, and the



MISS DOROTHY MEYERS AND HER PRIZE-WINNING WHITE.

distances. From the hotel every car could be seen coming from the six-mile point and finishing at the one-mile point, hundreds standing on the bridge and watching them pass under. Lander's time was 4:55, a record for stripped touring cars for five miles.

Mr. Adriance won the ten-mile open handicap for the Windsor Hotel trophy, from the 2:20 mark.

In the one-mile, best two in three, heat race the Thomas Flyer ran an inches finish in each heat with the Peerless of Mr. Lamper, the latter car winning the second heat in the fast time of 1:03 4-5 with tonneau and all fittings on. The Thomas took the first heat in 1:04 3-5 and the second in 1:05.

Wheeler's Peerless Took Both Handicaps.

The race closed Friday with two handicaps, one of a mile and another of five miles, both won by Charles Wheeler over small fields in his Peerless car, and time trials at a mile by J. A. Lander in the 50-horsepower Thomas of Charles Creelman. Lander, driving the car with four on board hanging by their eye teeth, did the mile in :59, and alone he did :57 2-5. Later in the day in a handicap he burst a crankcase and put a cylinder out of business. His best performance was the five miles in 4:55 in the five-mile handicap, as this fast ride was made from a standing start.

Kansas City has had an automobile wedding. Chauffeur Joseph Hatfield drove his white-ribboned car, containing his bride-elect, to the front of the court house in that city, and Justice Michelson tied the knot. By way of celebration, immediately after the ceremony, the bridegroom drove his car up the long stairway approach to the courthouse, where the happy couple were photographed.



WM. ADRIANCE, JR., IN 30-H.P. STEVENS-DURYEA.

TO WORK FOR SOUTHERN ROADS.

ATLANTIC BEACH, FLA., April 12.—The Hon. Ben L. Jones, of Macon, Ga., candidate for the Assembly, alderman, and a prominent politician in Georgia, owner of a big automobile business, president of the Macon Automobile Club, and proprietor of a Macon newspaper, was elected president of the Southern Motor Federation, an organization created to build good roads throughout the South and to bring about the construction of a great trunk line road from Richmond, Va., to Jacksonville. Mr. Jones will enter enthusiastically into this, and will have as his co-workers some of the greatest road builders of the country.

The Southern Motor Federation will work in entire harmony with the American Automobile Association, which the Macon Automobile has just joined.

The meeting was held at the Hotel Continental, Thursday morning, and all the prominent motorists in Florida joined in the movement without question.

The following officers and directors were elected: President, Hon. Ben L. Jones, Macon Automobile Club; first vice-president, Frank C. Beatty, Savannah Automobile Club; second vice-president, Col. Joseph P. Bryan, editor *Richmond Times-Dispatch*; third vice-president, George W. Vanderbilt, Asheville, N. C.; secretary, W. R. Rannie, Jacksonville Automobile and Motor Boat Club; treasurer, Edward Inman, of Atlanta, Ga.; directors: George W. Wilson, editor *Jacksonville Times-Union*; Clark Howell, editor *Atlanta Constitution*; J. H. Estill, editor *Savannah News*; Major W. A. Hempill; State Attorney-General Gilmer, Raleigh, N. C.; John B. Parkinson, F. E. C. A. A., Daytona, Fla.; W. A. McWilliams, president Board of Trade, St. Augustine, Fla.; Thomas W. Layless, editor *Augusta Chronicle*; John Anderson, Ormond, Fla.; Gunby Jordan, Columbia, Ga.; Mr. Gonzales, editor *State*, Columbia, S. C.; Charles K. Murray, editor *Landmark*, Norfolk, Va.; Hon. W. P. Brownlow, Nashville, Tenn.; R. S. Munger, Birmingham Automobile Club, Alabama.

INDIANA ROUSED TO ACTION.

INDIANAPOLIS, IND., April 16.—The next session of the Indiana legislature, which will convene in January, 1907, will be asked to enact good roads legislation, which, if passed, may mean a complete reorganization of the highway system of the state. There is a general feeling throughout the state that the old system is inadequate to accomplish the results necessary. At present roads are constructed by the various townships, and when completed, turned over to the county in which they are located for future care. Of the 1,014 townships in the state, many are not financially able to make the necessary improvements. On the other hand, after the roads are completed, a careless board of county commissioners may undo all the work accomplished by failure to keep the roads in condition, and there is frequently contention between the townships or counties in regard to roads that lie on county lines, and frequently the roads for half a mile on either side of the county line are left in bad condition.

At the last session of the legislature, Representative Yencer, representing a rich farming community, offered a bill providing for the establishment of a State Highway Commission, carrying with it an appropriation of \$5,000,000, and placing the care of the roads throughout the state under the control of the commission. The plan was hooted at and voted down without much consideration. There has been much discussion since that time, however, and it is likely the next legislature will have to consider a very similar measure.

The agitation for good roads, it is expected, will come more from the farmers than from automobile owners, although it is expected the automobile interests will take up the good roads fight after it is once started. For some reason the movement for good roads in Indiana has not kept pace with the growth of the automobile industry.

THE FLORIDA AEROPLANE EVENTS.

JACKSONVILLE, FLA., April 14.—The aeroplane feature of the Atlantic-Pablo Beach meet was one of disaster. On Monday, the opening day, Charles Hamilton soared aloft in the tow of automobiles, and then made a spectacular descent into the fringe of waves. The ascent was made in tow of two White steamers, property of H. M. Flagler. These, hitched side by side, were pulled together by the force of the giant aeroplane as it mounted higher and higher. Hamilton yelled early in the game to stop, and the spectators, hearing the snapping of wires and the breaking of bamboo under the mighty strain, stood spellbound, awaiting the certain finish of the daring air navigator. His cries to stop finally reached the ears of his mentor, Israel Ludlow, who was riding in one of the steamers. The two cars stopped, and then started as spectacular an airship descent as was ever seen. The huge kite plunged this way and that and then turned half over as it plunged straight down to earth. Nearing the beach it struck on one corner and turned partly over. Hamilton, from his seat in the center, was thrown out into the tangle of wires and bamboo and landed at the corner which struck. He was cut across the nose and his arm was caught in a tangle of bamboo



HAMILTON COMES TO GRIEF AT THE WATER'S EDGE.

anywhere. Each aeroplane has served its purpose, and each proves a theory. This ascension gave me a lot of knowledge."

Then on Saturday came the disaster to poor Ludlow. Again the two automobiles were utilized in getting the larger aeroplane into action. A strong south wind lifted the big kite easily, and it was soon over 200 feet in the air. A crash of the bamboo told of broken framework, and the collapse was in such manner that it prevented Ludlow from saving himself. Down he crashed to the beach, striking squarely on the base of his spine, with the aeroplane on top of him. As expeditiously as possible the injured man was taken to the Hotel Continental, then hurried to a train and immediately started for New York City, where it is now hoped that specialists of Roosevelt Hospital will be able to save his life, despite the injury to the spine that has left him partially paralyzed below the waist.

Referring to the aeroplane events, W. J. Morgan states that the flight of Ludlow was not a part of the official program. It was the original intention to engage Ludlow to make ascensions in a new motor-propelled dirigible aeroplane which he claimed to have constructed. This machine failed to materialize, and the flights of last week were made purely on the individual responsibility of the inventor. Engineers who had looked over the aeroplane in which Ludlow met his accident of Saturday predicted that dire results would follow its continued use. Poor mechanical construction and material were responsible for the collapse, which was sudden and complete.



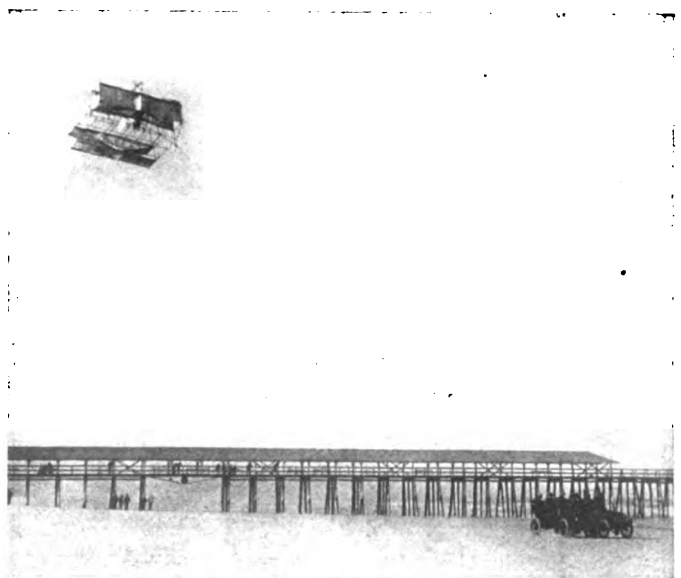
ISRAEL LUDLOW AND CHARLES HAMILTON.

rods and wires. "Senator" Morgan and Alex Schwalbach, who had raced down the beach about 200 yards, reached Hamilton, and, in water to their shoe tops, pulled him out. For a moment only he collapsed, and then walked away, smiling, his face covered with blood from the cut on his nose. The aeroplane was rescued and hauled up the beach away from the incoming tide.

As a spectacle the ascent was worth the price of a trip from New York. Successful it was without a doubt, for in the strong wind blowing Hamilton would undoubtedly have remained in the air at the end of the huge kite string indefinitely. In fact, he said to-night: "Even while the wires and bamboo poles were snapping and I realized I must be tumbling soon, I was figuring upon the picnic I would have sending down for grub and staying up all night. I could not steer the thing, and am going to get up something now to enable me to do so. But say, with that motor and those propellers I can drive the kite anywhere and at will. This trip was the best I've ever made, and I'm going to fix it up now and race Mr. Ludlow."

Dr. Israel Ludlow, of New York, student in the school of aeronautics, and tireless worker in the aeroplane school, was wild with delight over the way in which "No. 16" soared.

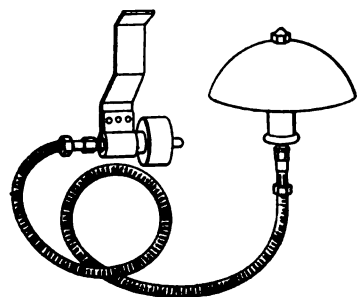
"Hamilton's trip proved a lot to me," said Mr. Ludlow, "and I am pleased. 'No. 17' will be a big improvement and I shall strengthen many parts which gave out to-day. I am satisfied that aeroplane navigation is not far distant, and that with a good motor we shall be able to mount from the ground and soar away



LUDLOW IN FLIGHT OVER THE PIER.

THE FRENCH SMALL INVENTORS' SHOW.

PARIS, April 3.—There is an atmosphere of invention about the modest exhibition held on the borders of the working-class quarter of Paris, under the title of the Small Inventors' Exhibition. The threadbare inventor, who will give but scrappy details of his successful model for fear he should be robbed by the rich speculator; the glib young man with a worthless physical exerciser, troubled with no such fears; the hard-working mechanic with a useful little invention on display, and one or two more in his pocket which he brings out only when the visitor has won his confidence—all are to be met here. It is because of the presence of this last class that the big automobile manufacturer runs down to the show, anxious to adopt small improvements or encourage men on the right track.

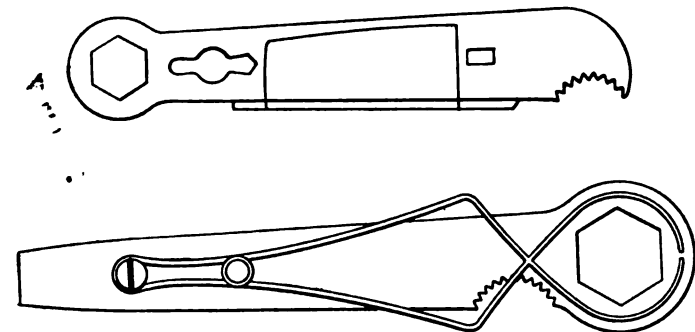


DONÉ COMBINED BELL AND SIREN.

Although the show is devoted to automobile, bicycle and kindred inventions, many of the exhibits must be put in the miscellaneous class; a majority are applicable only to cycles and the smallest number pertain to automobiles. All the inventions of any value have been patented; most of them have been put on the French market, but very few indeed have been sold abroad.

The *clé-pince* Evrard, made by M. Pupille, 2 Avenue Parmentier, Paris, is an ordinary flat key or wrench for sparking plugs with the addition of a pair of spring nippers bolted on to one of the surfaces, so as to close around the plug and hold it tightly, thus allowing it to be unscrewed and taken out without any danger of falling on the ground and without any risk of burning the hands. An improved model, which has been patented but is not yet on the market, allows a sparking plug to be dismantled and taken to pieces without the aid of any other instrument. It consists of the same flat key for unscrewing the plug, surrounded by the same flexible nippers, a screwdriver at the opposite end, and a separate key to hook onto the former, forming by means of a notched semicircle in each pair of pincers for dismantling the porcelain. When closed the improved model occupies no more space than the ordinary type, and yet contains everything necessary for taking a plug to pieces; one of the surfaces of the key is prepared for cleaning the electrodes.

On an adjoining stand is a sparking plug with revolving fan calculated to protect the terminals from oil and soot. It was in-



EVARD COMBINATION SPARK PLUG REMOVING AND DISMOUNTING TOOLS.

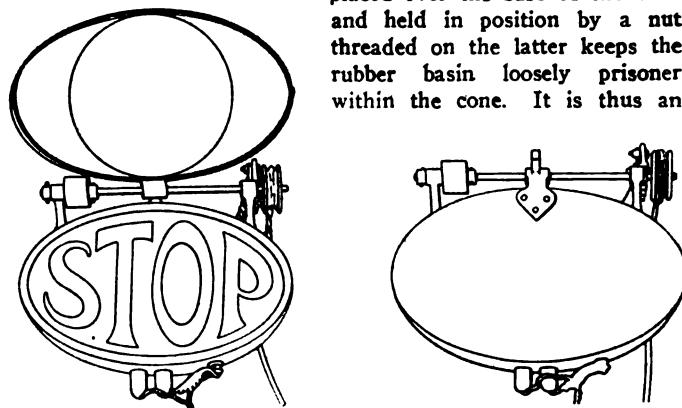
vented by C. Strumpell, 29 rue du Chateau d'Eau, Paris. Its peculiarity is that the fan is not screwed to a cross member on the interior of the plug, but revolves freely on a nicked frame riveted to the plug.

An appliance to obtain an open exhaust at pleasure is shown by Paul Fuant, of 38 rue Brunel, Paris. A brass sleeve with a

ball-shaped lid is placed over a cut-out on the exhaust tube and kept closed by means of a strong spring. By a small lever on the dashboard the pressure of the spring can be overcome and an open exhaust obtained.

To diminish street accidents, M. Chanut has invented an apparatus to warn drivers following in the rear of a car of the intention of the operator to stop. In daylight a careful driver does this by holding up his hand, but at night such a method is of no use. M. Chanut's appliance consists of a metal plate containing in bold letters the word STOP, covered by a hinged metal shield. Whenever the car is about to slacken speed or come to a standstill the warning word is made visible by raising the plate, either by a cable connected to a separate pedal or by being connected to the clutch pedal. The signal is white on a black background by day and illuminated at night by means of an electric lamp which lights up immediately the plate is raised and goes out when it is let down.

A tire pump connection which has only to be placed on the valve without any screwing or adjusting whatever, is shown on one of the stands. In place of the usual screwed-on connection there is an inverted metal cone into which is fitted a flanged India-rubber bowl with an airhole in its base. A flanged washer placed over the base of the cone and held in position by a nut threaded on the latter keeps the rubber basin loosely prisoner within the cone. It is thus an



CHANUT SIGNAL FOR REAR OF CAR, OPEN AND CLOSED.

inverted rubber-lined cone which is placed over the tire valve. The greater the pressure of air from the pump the more tightly is the connection forced down on the valve.

An improved split-pin is shown by the same inventor. Instead of opening out the two points of the pin to prevent it falling from the hole through which it passes, there are two semicircular spring arms which clip round the shaft through which the pin passes.

M. Julien, of 65 Boulevard de Grenelle, exposes a new form of magneto for motorcycles. It is placed where the trembler is usually found but is keyed directly onto the motor shaft. Thus all gearing is abolished and variation in sparking owing to vibration cannot occur. The ignition may be advanced or retarded to an almost impossible degree by this system.

A combined bell and siren is shown by Emile Doué, to be driven by a friction pulley from the flywheel of the motor. A small lever on the dashboard puts either the bell or the siren into gear at will. This appliance has been designed to permit the use of a bell emitting a sound similar to the bells employed on electric automobiles for town use, and the siren for the open country.

A good detachable rim, shown by M. Houdel, enables a tire to be removed and replaced in a few minutes. The outside rim is removable after three spring catches have been withdrawn and the rim turned around until its teeth correspond with the notches on the wheel. The spring catches are of the "bayonet" type and are locked in a release position by giving a half turn after withdrawing them.

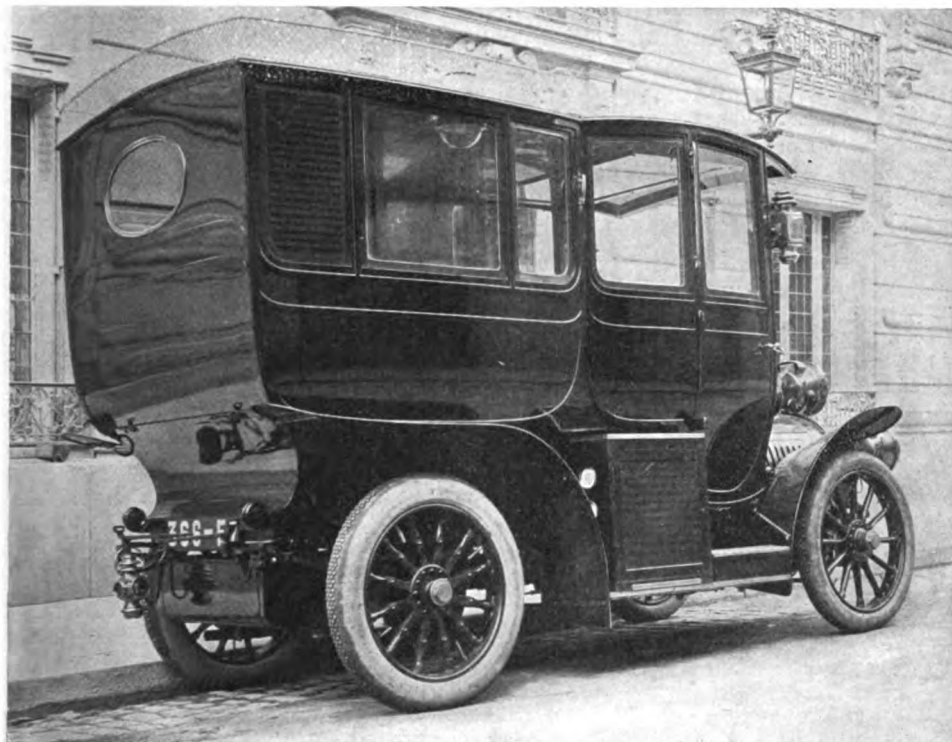
A NEW AND ORIGINAL TOURING BODY.

PARIS, April 10.—Experienced automobilists are not unanimous as to the type of car best suited for extensive touring. While

into the center of the car, and to reach the transverse fixed rear seat with seating accommodation for three. A large amount of space is left free between the front and rear seats, giving ample room for packages and plenty of space for moving about. A substantial table formed of two leaves hinged at either side can be instantly folded out to go right across the car. The rear seat is not exactly at the rear of the car, the two corners being occupied from floor to roof by cupboards about ten inches deep, specially fitted for carrying table utensils and traveling necessities. Thus in center of rear portion, behind the seat, is a recess ten inches deep. This has been converted into a locker, the top of which, on a level with top of seat, forms a shelf. The seats and insides of doors are upholstered in green leather, every other part of the interior, including the ceiling, being in polished rosewood. This type of interior fitting is now very popular for closed bodies, it giving an elegant appearance and offering no lodging place for dust. There are four separate windows on each side, each one letting down into a pocket, a big oval window in the rear recess already mentioned, and the front consists of a glass screen in one piece

hinged to fold up against roof. Artificial light is provided by two globular acetylene lamps in the ceiling, and extra luggage room is provided under the rear seats.

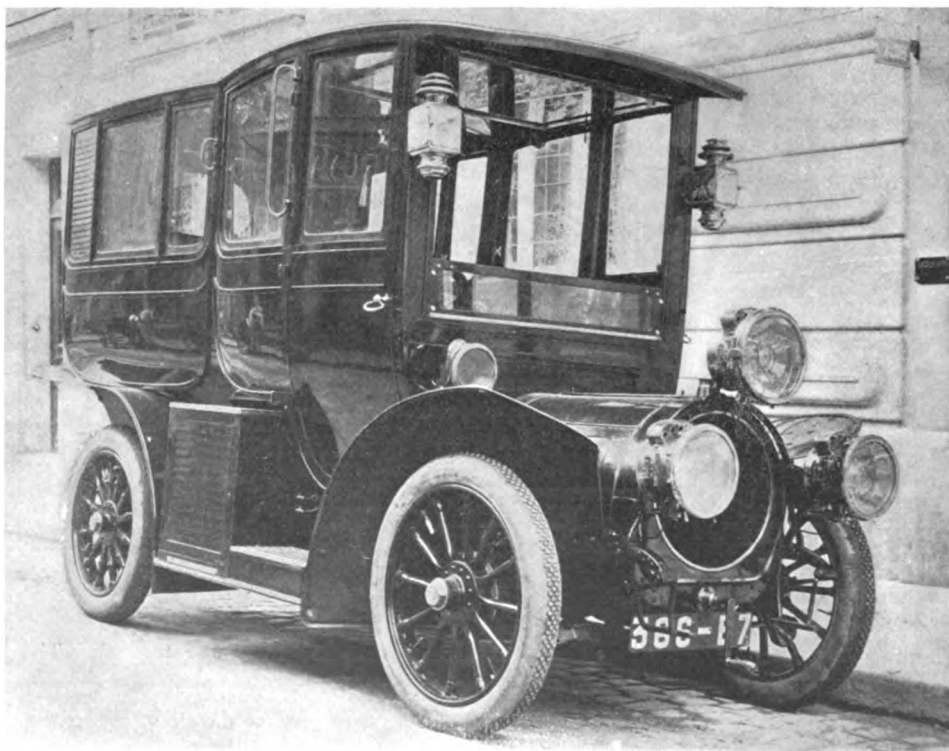
Elegance of form is obtained by making the sides of three



VIEW OF CAR FROM REAR SHOWING AMPLE PROPORTIONS OF BODY.

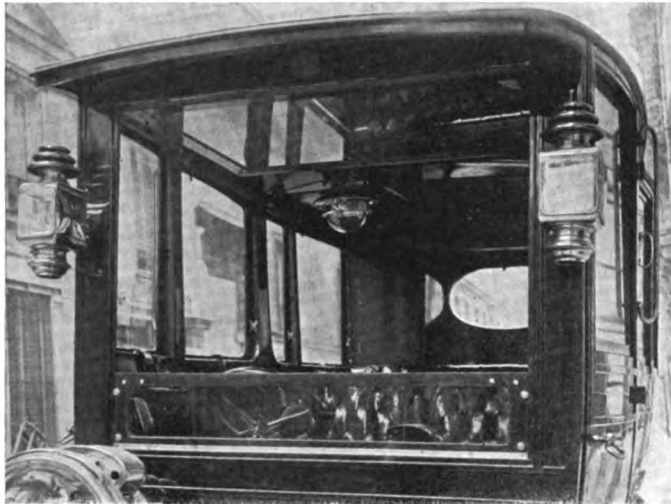
the side-entrance double phaeton body fitted with a serviceable hood and having some provision for carrying luggage is generally accepted as the model of a touring car, its scanty shelter against inclement weather causes many to search for something more satisfactory. Monsieur Gouvie, a well-known Parisian automobilist, has undertaken the search, and had constructed for his own use quite an original type of body. The automobile is an 18-24-horsepower Engène Brillié, with four-cylinder vertical motor placed under a circular bonnet; it has transmission by propeller shaft to rear axle, four speeds and reverse on same lever and is suspended on four long, semi-elliptic springs.

The maximum amount of passenger accommodation has been secured by making a clean sweep of the two open front seats occupied by the driver and mechanic, and constructing a closed body of one compartment only from dashboard to rear of chassis. Entrance is by side doors, opening from front to rear, and placed right at the fore end. One is struck on entering by the length of the interior, owing to there being only one compartment. The driver's seat, in the usual position, is a collapsible armchair in olive green leather, and beside it is a similar folding seat for a passenger. This seat is folded up in order to pass



CAR AS SEEN FROM THE FRONT, SHOWING LOCATION OF ENTRANCE.

separate panels, the largest being the rear one, which narrows in both back and front, the other two, one of which forms the door, are of equal size, the front one curving in considerably. The roof, the rear portion of which is surrounded by a metal gallery painted white, forms two distinct portions, the front half extending over the dash about six inches and having a decided curve. Wide metal fenders cover all wheels, and there is a running footboard fixed rather low, on the top of which is a tool-



FRONT VIEW OF BODY, SHOWING PORTION OF INTERIOR.

chest with rubber-covered, brass-bound top, forming a step into the car, and immediately to the rear of it a large chest about eighteen inches high, the top of which is covered with rubber, and forms a step to roof. The chest on the left-hand footboard is for the chauffeur's use, the one on the opposite side containing the acetylene apparatus. The exterior of the two cupboards forming rear of car are formed of false Venetian shutters in order to relieve the plainness which would result from an ordinary panel, and the doors of the two chests on footboard are treated in the same way.

Every imaginable fitting is to be found on the car; thus there are five lamps—one big searchlight on front of bonnet, one lamp on each side of bonnet and a pair of lanterns at front of body of car—speed indicator, clocks, grade indicator, etc. The body work is by Botiaux, of Levallois, near Paris, and the total weight of the car with five passengers on board is 4,800 pounds.

AUTOMOBILES IN CANADA.

U. S. Consul Worman, of Three Rivers, Quebec, says that while the local parliament of that province is planning to restrict the speed of automobiles by enactments that may limit them to four miles per hour, and other like unfavorable legislation, the people of the Dominion of the Great Northwest are providing every possible stimulus to automobilism. At Winnipeg, Manitoba, it is proposed to construct a 158-mile road for automobilists. It will be oval in form, and the expense of construction and maintenance will be met by the tolls collected from those who use it. It is proposed to run some big races on the road, which will be oiled to keep down the dust.

SURPRISING GERMAN INFORMATION.

U. S. Consul Harris writes from Mannheim, in response to an Ohio inquiry on the possible demand for motor boats in Germany. He says:

"It would seem that Germany should be a good market for motor boats on account of the many navigable rivers, but boating has never become a popular Teutonic amusement. Mannheim, at the junction of the Rhine and Necker, boasts of only one or two motor boats. Efficient American agents might personally popularize boating by persistent efforts, but whether the trade would justify it is the question that must be answered by the trial.

The same undeveloped taste exists in regard to automobiles. With superior highways and picturesque drives, they are not used for pleasure. Naturally a people who have not cared to drive for recreation have not cared to use the automobile, and German factories are selling their machines largely in England and other countries, finding the home market a limited one, restricted to the sporting class."

A YOUTHFUL PACIFIC COAST GENIUS.

California possesses a youth of mechanical bent, who, if he develops skill in his maturer years in proportion to that exhibited in his first efforts will make a name for himself in the engineering world. His name is Claude M. Gill, his age 18, and he resides at 1119 East Main street, Stockton. He tells the story of his transformation of an old automobile into a modern machine in his own way, as follows:

"After consummating the purchase of a second-hand Model A Cadillac, of somewhat antique pattern, the problem which confronted me, geometrically stated, was: Given—an old automobile; required—to transform it into an up-to-date car.

"When I came into possession of the car it was not equipped with a tonneau, and had no hood to speak of, consequently the first problem was to make a tonneau; the second to modernize the old hood, extending it some twelve inches. As the illustration shows, the tonneau seat is higher than the front one. This was done to allow ample foot room.

"The old hood was cut off as far back as possible and the new dashboard bolted to the angle iron frame. The new hood was made of galvanized iron, the front opening being of the same size and shape as the radiator. Two large angle irons were bolted to the forward cross member of the frame and the radiator fastened to the uprights. The spark coil was moved from the inside of the hood to the dashboard.

"The starting apparatus was entirely changed. Formerly there had been a sprocket and ratchet on the engine shaft, communicating by chain to a countershaft just forward of the flywheel, the starting crank connecting to this countershaft. In removing the sprocket from the engine shaft it was found that the same key which held the flywheel retained the ratchet block. A cylindrical steel block was then made, having a bore equal in diameter to the diameter of the engine shaft, and having a key-



CADILLAC RECONSTRUCTED BY 18-YEAR-OLD BOY.

way to fit the key already there. A 3-8-inch hole was drilled through the block, perpendicular to the bore, and a steel pin driven through. The starting crank end was made after the usual pattern. The crank itself had to be made like an elongated S in order to clear the running board.

"Both body and gear were painted as deep a blue as it was possible to obtain, and striped with gold leaf. The entire cost of reconstruction did not exceed \$100."

PROBLEM OF A. A. A. TOUR.

BY A 1905 GLIDDEN TOURIST.

In view of the difficulty that the A. A. A. Touring Committee and the officers of the National Association of Automobile Manufacturers, who were called to its assistance, have found, in suggesting rules and conditions for the 1906 A. A. A. tour for the Glidden Trophy, it is pertinent to consider the contest fundamentally.

Perhaps it is unfortunate that the deed of gift of the trophy is not more specific, especially as regards the purpose of the contest or the object sought to be attained by the donor. On the contrary, however, this indefiniteness gives wide latitude to the committee in drafting the rules from year to year.

The only conditions permanently fixed by the deed of gift that pertain directly to the contest are: The total distance must be not less than 1,000 miles, and not less than 500 miles shall be traversed in a week; the tour shall be over regularly used highways in the country of the club holding the trophy (won by one of its members) except in the years 1905, 1906 and 1907, when the contest shall be held in the United States or Canada, or in both; each car must be driven by its owner or by a driver approved by the committee, the owner being a passenger.

All other rules and conditions governing the conduct of the tour are left to be formulated by the commission of seven, consisting of the president, the donor of the trophy, and the presidents of the A. C., and of the automobile clubs of Great Britain, France, Germany and a Canadian club to be recognized by the A. A. A. But the Commission turned over to the A. A. A. Touring Committee the entire conduct of the 1906 event.

There were very few hard and fast rules for the tour of 1905, and there were no observers; and as one of the direct results of the absence of such restraining influences the tour was by far the most enjoyable long-distance automobile contest ever organized in America. There were other less desirable results also, it is true, which elicited some complaints from residents of certain sections through which the tourists passed, but simple means can be adopted to prevent repetition of this. The award of the trophy, although made in a non-technical and very loose way, doubtless went to the man and car most entitled to the honor, and no serious criticism was made regarding it.

Formidable technical rules tend to discourage many owners from entering for such a competition. Touring is not a business to be taken too seriously, especially at a season of the year when everybody is in the mood and physical condition requiring relaxation, and it is an open question if the pastime will not be encouraged quite as much by promoting the pleasure and social side of the occasion as by laboriously checking the running times, the stoppages, fuel and oil consumption, mechanical and tire troubles and other performances and deficiencies of the cars.

It is submitted that the prime object of touring is to realize enjoyment—of the exhilaration of swift, easy motion and of the scenery and incidents of travel through unaccustomed country. Since discomfort is destructive of that enjoyment, the factors contributing to easy riding, protection from dust, heat and bad weather, and conveniences for carrying extra clothing, luncheons and refreshments are entitled to a proportion of credit marks.

It is also submitted that the driving has as much to do with safety and enjoyment when touring as have the details of car construction and appointment. As a matter of fact, the deed of gift indicates that the donor of the trophy had the matter of driving very much in mind when offering it, and it is a matter of record that the trophy was won last year quite as much by the careful way in which Percy Pierce drove his car as by the perfections of the vehicle itself. Driving should, therefore, be figured prominently in the points table. Ease of control and facility of handling, as on narrow, crooked, rough and hilly roads, such as are common in America, are prime factors.

Speed, above the legal maximum of twenty miles an hour, is unworthy of credit and should be penalized.

Of course mechanical reliability, freedom from ignition troubles, fuel and lubricating oil consumption, and cost and weight of car per passenger should all be given due recognition. It is also time that tire reliability be given proper attention. Tires are just as essential a part of a car as the body is, and tire troubles and delays are as vexatious as ignition troubles.

From such basic axioms the Commission can readily prepare a table of point credits, with 100 or 1,000 as the total number possible for any car to be given by a single voter. Copies of this could be given to each member of the committee and to each participant in the tour; records could be kept, as usual, of fuel, oil, and water consumption, weight, price, hill-climbing times, arrivals and departures within certain fixed hours, and number of passengers and weight of baggage carried, and at the end of the tour each participant could cast one vote for each of certain factors determined by the performance of the cars and their drivers in the run.

Members of the committee, who would have a better opportunity for making observations than the others and who would be outnumbered more than ten times, could cast, say, ten votes for each factor. Each voter could scatter his votes among as many cars as he chose, casting one (or, if a commissioner, ten) for the best driver, another for the car having the least mechanical trouble, another for the one affording its passengers the most comfort, and so on.

When all the votes had been counted the totals for each car could be multiplied by the number of points credited to each factor, and the car and driver having the largest grand total would be awarded the trophy.

Preponderance of any single make of car in the tour would not weigh seriously against justice, as the votes of the passengers in those cars would be scattered among the several cars of that make and their drivers; moreover, the larger voting power of the committee would offset their strength. A light, inexpensive car would stand only a fair chance of winning against a heavy, powerful and costly machine, and, left thus to a jury of their peers, nobody would have ground for charging bias in the award.

FRENCH AUTOMOBILE STATISTICS.

PARIS, April 10.—Statistics have just been published by the customs authorities showing a remarkable increase in the value of French automobile exports from the year 1898 to 1905. In 1898 the total value of exports was \$349,870; last year it reached the total of \$18,984,346. The following is the official table:

COUNTRY	1898	1899	1900	1901	1902	1903	1904	1905
England.....	\$113,814	\$182,104	\$505,904	\$1,622,576	\$3,837,986	\$6,335,420	\$8,992,850	\$11,226,382
Germany.....		98,258	200,782	232,372	371,884	1,078,304	1,446,420	1,960,600
Belgium.....	40,342	96,932	114,706	232,320	408,764	735,726	974,242	1,270,186
Spain.....		92,962	513,432				187,550	643,222
Italy.....	20,746		145,496	291,826	483,432	472,674	526,862	650,376
Other countries.....	56,648	146,098	252,392	435,978	588,374	1,056,492	1,662,530	2,325,274
Algeria.....	96,234	33,342	65,106	160,224	227,036	363,734	520,172	662,768
Colonies.....	22,086	203,970	119,654	131,862	126,400	124,988	122,308	236,538
Total.....	\$349,870	\$851,866	\$1,923,472	\$3,156,458	\$6,043,876	\$10,167,428	\$14,481,856	\$18,984,346



KAUF-HAUS (CHAMBER OF COMMERCE).

the east into Siebenburgen, or, as we call it, Transylvania, the easternmost province of Hungary, and the Land of the Grail in replica, where the mountains lie bathed in autumnal fogs, that cover and uncover the purpling heather, and where the trails that lead up to robber-nests and defiles, such as the merry knights would have delighted in, wind on and off to nowhere at all. And the kernel of this region, the heart of the Carpathians, is Kronstadt.

After months in the Balkans the very entry into Kronstadt is charming. Unlike Balkan railways, the train actually enters the city itself, or seems to. In the Balkans, to prevent ruffianly soldiers stopping off between connections, stations sometimes are as much as a mile from the city. Furthermore, the hotel is directly

In The Heart *of* The Carpathians

by *FELIX J. KOCH*

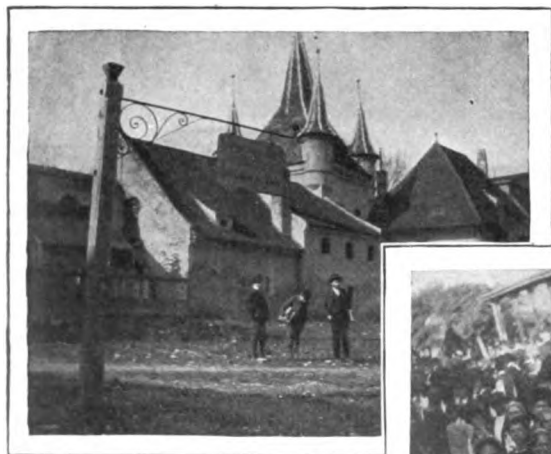


IT was shortly after nine at night that we came out of

breakfast. Though bounded on the north, south and west by all Magyardom, with an ocean of Slavs to the eastward, here in Kronstadt was a bit of Germany, the primitive as even the occasional tourist into Darkest Germany seldom sees it. Heavy Teuton tables, with red tablecloths, the dish of the "Wiener sausages" and the little glass bowl of horseradish with the wooden ladle, the potato bread, smacking of the potato, as if to prove it no deception, and the beer, the cruet of pink vinegar and the picturesque hotel maid, took one back, in fancy, to Darmstadt or the Rhinegau.

Then came the deception. Kronstadt was not yet sufficiently far out of the east to have town and railway meet. The city itself was some distance off, but luckily a little narrow-gauge bound the two, and at 9:50 o'clock one might go. The narrow-gauge proved to be an ordinary street car, the size of our railway cars, divided by an aisle down the center, at either side of which the plain wooden benches were planted, while the body of the car was separated into two sections, for first and second-class respectively. The fare on the vehicle, first-class, was four cents, American copper.

Of that ride through the Transylvania country, just a word. To right and left the magnificent forested Transylvania Alps rose in majesty, bathed in all the radiance of autumnal tints. At their bases were the gardens of Carpathia, with peasants wearing "civil" and queer round caps of wool, brown as chocolate, working among the flowers. A kindly lot they are, these Transylvanian folk, with features that are decidedly Teuton, and ways that are of Germany, also. In fact, even the signboards of Carpathia are in German, though the Magyar is everywhere added, out of compliment to the ruler. Here and there clumsy wagons, with roofs of matting, go by, drawn by pairs of white oxen, and from beneath the arched cover of these float



HONTER'S CHURCH.

'cross the street, as it never is in the Danubian States.

So, at least, it seemed that evening. Over the way to the hotel, and then to the long table in its restaurant, to a typical Transylvanian supper—four sausages, horseradish and unbuttered bread. Then to a room on the ground floor, where through the frost on the windows one could see the depot lights opposite; a candle to light and to heat one, and to bed beneath the double blankets of Transylvania, to sleep soundly till sunrise.

In the morning the "touring" of Carpathia began. It was cold—bitter cold—in these uplands, on October 24, and the Golden time in Siebenburgen, of which Jokai wrote, seemed long to have gone, as one watched the shivering peasants through the window, while we drew inspiration from our



TYPICAL TRANSYLVANIANS EN MASSE.



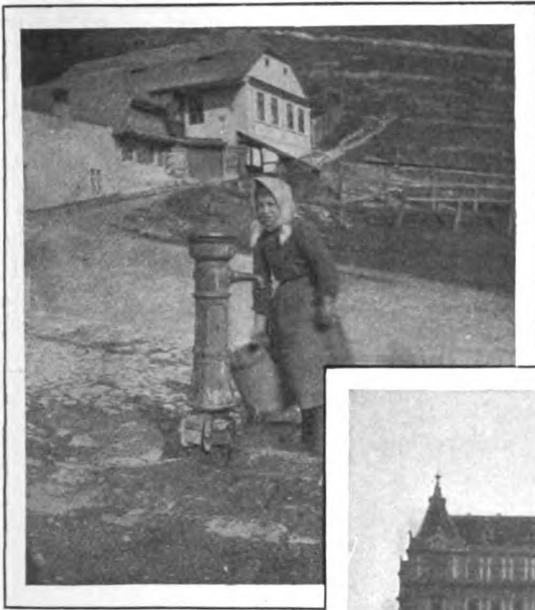
THE POORER SECTION OF KRONSTADT.

the voices, chattering in the language of the fatherland. High up on one of the peaks, gilded by the October sun, stands a millennial monument, rising as does Brocks' monument at Niagara, from a palisade of trees in the distance, and like the American replica, with the upper mountain slopes broken with palisades of rock also, on which the snows already lie deep. Beneath, however, the illusion is broken, for there nestles the city of Kronstadt, and Kronstadt is a mass of gay color, the houses coated externally with the concrete, tinted in delicate shades. Like the houses

plays are far from unattractive. Everywhere, however, one notes the leisure of life in Transylvania, if only by the number of groups halting on the thoroughfare to chat. Even the mothers, with their babies done up in "wickel-kind" fashion, have caught the epidemic and loiter when they should be at home.

In the center of the square, or, as they say, the "platz," stands the Rath-haus, in the olden style, much like the Römer of Frankfurt in its suggestions. About the four sides of the square are the stores, the narrow, interesting shops of Kronstadt. Everything is here for sale, from the Alpine horn to fine jewelry, and in a music store our own American ragtime. Hacks pass up and down on the cobbled square, taking people to the tall, yellow Rath-haus, or again to their homes, for cab-riding is exceedingly cheap in these lands. The bazaars that one has grown accustomed to in the East have gone from the plaza, and there are only the open bread-booths to recall them. The show windows of the pretty stores, however, open out toward the street, perhaps from the fashion of the shutters to the grand bazaars. Nor is the color of costumery one finds in sunrise lands among the poorer classes; for at Kronstadt there are shawls about the head, or a kerchief to replace the hat, and where the waists of the women are gay in their color, the cut is decidedly modern.

Sight-seeing in Kronstadt does not take long. One goes first to Honter's old church, to breathe again the spirit of the Reformation, and let memory wander back to the struggles for religious liberty. A replica of the churches of the north-land, of the days of Luther and Calvin, is this isolated edifice on the bounds of Moslem lands, with the sloping



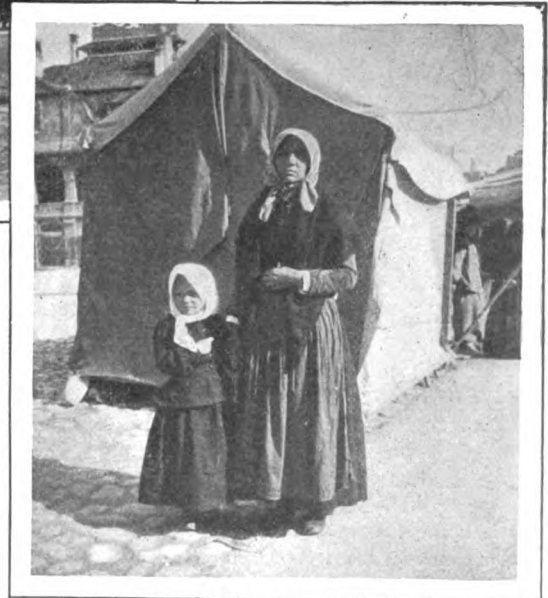
A VISIT TO THE OLD PUMP.

of Germany of the long ago, into this concrete is set darkened beams of heavy timber, and there are deeply seasoned gables and projecting eaves in harmony, and, above all, the double windows against the winter, with the plants blooming between, as they do at Poprad in the Hohe Tatra, and again in Servia. There are barracks here, too, and they seem almost Prussian in their style.

Then one is in Kronstadt, the unknown. One is almost tempted to say he is in Strasburg, in Alsace, so great is the parallel. Side by side the houses rise, the fore facade set in imitation of stone, the houses on different heights, so as to make this fraternal proximity the more irregular. The people on the flagstone walks chat or greet in German, and here and there, to one side, is a residence, a garden, with the gay-colored glass balls that we are fond of on our Christmas trees, mounted on poles and set among the flowers. Then, too, there is a park and a handsome public school. There is also the elegant Finanz Palais, with the Palace of Justice (every official building is a palace in southeastern Europe) close by, of stone, modern and elegant; and within a stone's throw of these innovations the little street booth, with the woman selling gingerbread men, cakes in the shape of dolls, with the eyes outlined in pink or white sugar, and the "lepp-kuchen," dear to the German heart. Further up the street there are three-story homes, the exterior covered with stucco, and carvings that are decidedly overdone, and in the German patterning, with red and white predominating among the colors. Milk wagons, the cart filled with hay, in which on either side the rows of cans repose, are driven by women about these lanes, halting while their custodian stops to peer into the narrow windows of the modern stores, whose dis-



PALACE OF JUSTICE AT KRONSTADT.



MOTHER AND CHILD IN THE MARKET PLACE.

roofs, and the heavy steeple as a contrast to the mosques and minarets, not many miles away. Inside the old sandstone edifice there are the tiers of ancient pews, made a bit more comfortable by worn green baize, and with the name plates set to one side. Two rows of thick stone pillars divide the church into three aisles, and in the center of the chamber dozens of hard and austere settles—backless chairs is, perhaps, the better word—are placed. As in the Orient, old rugs and tapestries hang from the walls for ornament, a contrast to the more modern pews beneath the balconies, which extend out to the pillars on the right and left. There is no altar, as we would expect, in this

church of Siebenburgen, but instead, a rather pretty tall organ, rich in its wood carvings and a pulpit, from which one may look down the rows of pillars, hung heavy with heraldic trophies and signs of the hymns for the next service. In the north and center of Europe there are many churches such as these, but here in the East they are so rare that to see one is decidedly refreshing.

Over the way from Honter's church is the former Kauf-haus or chamber of commerce, pregnant with legends of the days of the guilds, though it is only a one-story structure, with concrete exterior daubed with a coating of yellow. All about it face the stores, now the "Kauf-houses" *de facto* of Kronstadt. Interesting is a shopping excursion among them. Copper-cake forms that recall Christmas baking on the Neckar; German procelains and Metlachs, old curving pipes, the mustache brushes that one finds among the military of Berlin, and plodding past, outside the quaint shops, the bouquet peddler, a woman with a tray on her head, who profits by the Teutonic love of flowers. Quaint projecting signs, often of a stork, hang out from the stores, and there are the circular yellow disks,—the plate into which the face of the newly shaven is dipped,—to indicate, as in Servia, the barber. Children trudge by, in small wool caps, peeping in at the garden restaurant, or at the office of the city-baths, a large establishment, and then run on towards their friends, the mountains, that rise ever up and all about, that they may go nutting, or enjoy the woodland pleasures of childhood.

Of sights, as the tourist seeks them, we have now about exhausted Kronstadt, and yet the golden time of Siebenburgen is at hand, and the siren of her beauty calls us to wander on. Streets of homes alone, lined with the gum-trees, from which the leaves are falling in the crisp late autumn air, lead off tempting one to explore. There is the very odor of falling leaves in the air, which makes this mountain valley of the town enchanting. A road leads up the mountain between the small houses, each plastered outer wall joined to its next neighbor, until the last ends at the bounds of the forest. Here live the poorer folk of Kronstadt, and the street has its old pump, where the little girls come with wooden water-jugs for the day's supply, looking off to the walls of two ancient ruins on the herglid, and a castle, better preserved in its roofs of red, on another. Where the Saxon gymnasium, or, as we call it, high school, stands, the way takes a turn down, and it is even more delightful to saunter between the low, one-story plaster houselets, with the green shutters, and the mountains behind, breathing a freedom that is sweet relief after the espionage one is subjected to in Turkey. In the lane there trickles down a rill of soapsuds, and old washtubs, by the curb, tell where the women empty their wash-water. Bells on passing peasant wagons tinkle merrily through the chilly air, and now and then the heavy rumble of a cart of lignite from the neighboring mines.

Then, again, one is back in the city, at the park, where the weak sun pierces between the falling leaves. There is a hospital with a park exposure, and there are squares of plain, yet neat homes, each with its windows open to the breeze, for the morning airing. Housemaids can be heard singing at their work through these open windows as they stop to fix the flowers on the sill or pass into the courtyards, which all the larger houses possess, to take out their sweepings. Here and there will be a shop, or a name plate, and one notes the names. Barabbas Joze! is the shoemaker at Kronstadt, and one A. Servatus, possibly a descendant of the reformer, plies another trade.

Then we are in another quarter. There every house strives to be painted in a different color from its neighbor; and even the schoolhouse is in yellow, with an edging of red brick, while the director's dwelling rooms, on the first floor, have the green shutters of Transylvania. Most of the houses have the plastered exterior, up to the low-hanging gables, when the uncolored frame prevails. Re-echoed by the mountains of rock is the sound of pounding carpets, unusual music for a far eastern land. A brook rambles down the main street here, and it is crossed by beams for its entire length, to prevent folk falling in. Houses open on this Venetian way and women chat in the doorways. There are

two small churches here, to which the women come from the mountains, alone in their wagons, or the girls trudge afoot, bundle on the head, a thing they dare not do in Turkey. Peasants, with wooden buckets of grapes on their backs, or bearing the tools of peasant Bavaria, flaxen-haired, blue-eyed children, Saxon in their descent, drive the geese from the gardens; schoolboys, in long trousers, long before our boys take to them, bid one another "adieu" before the three-story schoolhouse facing the park, in the shadow of the old ruin. One and all go by, out toward the border, where the ancient Cathedral Thor, the city gate of the middle ages, from which, as at Nurnberg, remains of former-town walls lead off, still stands. Children are everywhere on their way home for dinner, and past the new synagogue, into the gardens, behind the houses they swarm, stumbling against the plotted oleanders, to show mother the new souvenir post-cards which they have bought for a heller, as do children the world round, or perhaps a little sausage the butcher of Brasso (as Kronstadt is known in the vernacular) has given them. Possibly a wedding procession—the bride in veil and white silk gown and bridal wreath, or some lass in her communion dress goes by to attract attention. Then again the visitor turns to the ever-interesting stores. American typewriters and Boston shoe polish are here side by side with the gaily-decorated (aluminum paint or gilt for the most part) coffins, and the pipes and the grapes that mingle indiscriminately in some of the lesser establishments. Close by is the market hall, low and clean, and with flies remarkably few, and then the theater, where busts are set outside, with Shakespeare's in the center. Little pocket electric lamps, lasting five weeks with one battery, and selling at forty cents; Alpine hats and hunting bags (for there is much hunting in this region) and photographs are other specialties of the city, and prices are everywhere marked.

Away off on the outskirts, in the other direction, where the modern homes have dropped the old-style front, and a fort guards the passing wagon trains of lusterless coal, there is a promenade, with sycamores shading a deep ravine, from whose benches, over the beer or the wine, one may look off to the mountains, the villas and chalets, as in some resort in our own Alleghanies. Then it is, indeed, that one realizes the quiet of the Carpathians, and that it is the golden time in Siebenburgen.

THE BRITISH AUTO BOAT SEASON.

LONDON, April 12.—The forthcoming season promises to be a most interesting one in England and full of events, for the British Motor Boat Club has issued a long program extending from May 5 to September 15, starting with a cruise on the Thames with Commodore Admiral Sir William Kennedy in command. This is followed by a meeting of the Outdoor Boards on June 5 and a two-days' program at Liverpool on June 8 and 9, when a flying mile for a cup presented by the club is a principal feature. The dates from July 7 to 14 are subject to alteration, as the Motor Yacht Club carries out its reliability trials, selections and race for the British International Cup in July and August, and a clashing of fixtures is to be avoided.

As matters stand, the B. M. B. C. has a race from London to Cowes down for competition on Saturday, July 7, open to all bona-fide sea-going cruisers exceeding 25 feet in length and fitted with internal combustion engines. The course is about 200 nautical miles and the prizes consist of cash, cups and medals. A special gold medal will be awarded to the fastest vessel using exclusively heavy oil and completing the course within forty hours.

The "Entente Cordiale" cup will be competed for at Cowes on August 6, the event being open to all boats built or owned in either England or France. The races are continued at Cowes on August 7 and shift to Ryde for the 14th. Newspaper cups, and extremely handsome ones too, are in the center of interest at the three days' meet at Burnham-on-Crouch, when the three cups presented by the now defunct *Motorist and Traveler* and the *Motoring Illustrated* trophy will be run off. The third day, September 15, concludes the program with the flying mile championship.

THE GOOD ROADS SPEECH OF A WISE MAN.

WASHINGTON, D. C., April 16.—Good roads was the keynote of one of the ablest speeches made in Congress this session. It was delivered in the House of Representatives last week by Representative Lee of Georgia, who, with telling force, brought out fact after fact about the deplorable condition of American roads generally. It is a significant fact that his speech was listened to with the closest attention by members of the House.

Representative Lee began by saying that all civilized governments build roads and that all save our own have some established system for building and maintaining public highways, under the direction of skilled and competent officials. Early in this century some work of this kind was done by the Federal government. The dawn of railway building and steam transportation, he said, seems to have largely drawn public attention and enter-

yet, when a bill was recently introduced in this House to appropriate \$25,000,000 annually for abating this great and continuing loss, it was ridiculed in some quarters as a fake—visionary and impracticable—as if it were wild and unreasonable to stop a leak of hundreds of millions of dollars with this comparatively small appropriation. But those who reviled it have not seized upon the opportunity to propose a better plan.

"Forty millions of dollars were promptly handed out from the public treasury to pay for the privilege of spending \$200,000,000 more to dig a ditch in foreign lands more than a thousand miles from home. Not one-hundredth of one per cent. of our people will ever see it; not one in 1,000 of our people will ever feel his burden lightened or his joy and comforts of life increased when it is finished. One-half the sum it will cost, if intelligently expended



PORT LEE HILL IN NEW JERSEY, ACROSS THE HUDSON RIVER FROM 125TH STREET NEW YORK CITY, IS ONE OF THE MOST DIFFICULT INCLINES IN THE METROPOLITAN DISTRICT—THIS IS A POPE-HARTFORD CLIMBING THE GRADE.

prise from our common highways, as a natural consequence, for more than fifty years—years that have been full of throbbing life and vigor for us as a nation; years that have no parallel in the history of our race for triumphs of man over nature; years that have been filled with a succession of wonders and triumphs in every field of human thought and endeavor. But the greatest wonder of all these wondrous years is that as a nation we have utterly ignored our country roads, and we seem surprised when we look about us and find them no better than they were half a century ago.

Continuing, Mr. Lee said: "The able Secretary of Agriculture estimates that the cost, the extra burdens imposed upon this country by bad roads, is not less than \$600,000,000 annually. These figures almost stagger credulity, but who can gainsay them? And

upon our public highways during the next ten years, would give one hundred times as many comforts and pleasures to one thousand times as many of our people. The canal will be a great public utility, no doubt, but better roads are a crying public need, now—every day.

"If the army needs a road, it gets it. Even our possessions in the Far East, the Philippine Islands, have been the objects of our solicitous care to the extent of expending \$5,000,000 in building roads for them. Porto Rico, though not much larger than some of our counties, has had over \$3,000,000 expended upon its roads since it came into our possession. During our brief occupancy of Cuba our government expended two and a half millions upon its public roads. Even those little dots in the Pacific, the Hawaiian Islands, have come in for a share and have a contemplated

expenditure of \$2,500,000 upon their roads. These various sums aggregate \$13,000,000 that have been expended during the past few years in building roads, not a foot of which lies within the United States. What have we against our own people that we should deny to them blessings that are freely extended to the idle islanders of the seas?

"But other interests and forces are coming to the aid of the solitary and unorganized farmer. His friends in the cities, having grown rich and equipped themselves liberally with self-propelled vehicles, want better roads to roll them over, and they are interested in the problem of the roads. The manufacturer, learning from experience that bad roads interfere materially with his obtaining steady and continuous supplies of raw material, wants the roads improved. The millions of operatives in the mines, factories and shops are learning that bad roads increase the cost and disturb the regular supply of food products from the farms which they must have, and they want better roads. The merchant has learned that bad roads retard and repress trade, and he wants them mended. Our Post-Office Department is greatly hindered and hampered in its efforts to supply to the country regular and reliable mail service for lack of better roads. In fact, it would be hard to name an interest, an industry, or an individual who would not be benefited by better roads."

Representative Lee said that if he had the privilege of writing upon the statute books a law that had more of the promise and potency for immediate and lasting good to all the people than any law that has been proposed or discussed in the House, it would be a law creating a Department of Public Highways, to act through and in conjunction with state, county and municipal authorities in redeeming the country from the throes and thrall-dom of its miserable roads; and he would give that department not less than \$50,000,000 a year until the work had reached a satisfactory stage of advancement.

"So here we are," said he, "right in the middle of the road, and the sorriest kind of a road at that. 'A condition confronts us, not a theory.' Are not a hundred years of observation long enough to convince us that the roads will not reform themselves?"

HIGHWAY IMPROVEMENT IN GENERAL.

One rural delivery route within a few miles of Kansas City, Mo., has been discontinued and others may be because of the miserable condition of the Missouri roads. Although the county spends about \$150,000 a year on macadam roads—this money being derived from dramshop licenses, and most of it collected in Kansas City—comparatively little attention is given to the dirt roads, and it is because of this that the rural service has been discontinued.

An amendment to the Missouri State Constitution, permitting counties to levy fifteen cents on the \$100 valuation for roads improvement purposes has been declared unconstitutional by the Missouri Supreme Court. It was held that the act was not good law because it did not include in its provisions Kansas City, St. Louis and St. Joseph, the three largest cities of the state. The amendment was voted in 1900. It raised the former tax five cents. Curiously enough, it was a railroad which defeated the act. The Burlington, sued by Marion county, carried the case to the Supreme Court. Many of the counties had made the levy and provided for its disbursement.

Senator Armstrong, in his proposed amendments to the New York Highway law, provides that everywhere railroad crossings at grade shall be abolished. In a year from this date, when the State Engineer, acting through the town boards and boards of supervisors, has designated on a map the main highways that are to be improved with the \$50,000,000 voted by the people, then it will show clearly how many of these main highways are crossed at grade by railroads. Then it will be possible to intelligently take up with the state railroad commission the abolishment of each one of these grade crossings at some time during the next ten years, so that the improvement of the main highways and the abolishing of the grade crossings will be intelligently and systematically done.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

- April 18-21—Denver Automobile Show, Coliseum Hall. Denver Auto Show Association.
- April 21-28—Canada Automobile and Motor Exhibition, Arena, Montreal.
- May 14-19—New Orleans (La.) Automobile and Motor Show.
- May 24-26—Open Air Show, Empire City Track, New York Trade Association.

Tours.

- May 5...—Two-Gallon Fuel Efficiency Test, Automobile Club of America, New York.
- June 6...—Orphans' Day, Second Annual Celebration by the New York Motor Club.
- June 16-18—Three-Day Tour, Bay State Automobile Association, Boston to Rye Beach, N. H.
- June 18-23—Second Annual Economy Test, New York Motor Club.
- July 23...—Annual A. A. A. Tour for the Glidden Trophy, starting from Buffalo or Cleveland.
- Sept.—Endurance Run, Denver to Colorado Springs, Centennial Celebration Discovery of Pike's Peak.

Race Meets and Hill Climb.

- April 25-27—Atlantic City (N. J.) Automobile Meet.
- May 10...—Wilkes-Barre (Pa.) Centennial Jubilee Hill Climb.
- May 10-12—Macon, Georgia, Race Meet, Macon Automobile Club.
- May 30...—Boston Annual Meet of the Bay State Automobile Association, Readville Track.
- May 30...—Baltimore (Md.) Race Meet, Maryland Motor Exhibition Association.
- Sept. 22...—American Elimination Trials for Vanderbilt Cup Race (Long Island course probable).
- Sept.—Colorado Springs. Two-Day Meet. Centennial Celebration Discovery of Pike's Peak.
- Oct. 6...—Vanderbilt Cup Race, American Automobile Association.

FOREIGN.

Shows.

- April 15-May 1—Marseilles (France) International Automobile Exhibition.
- April 15-May—Milan (Italy) International Exhibition.
- April 23-May 6—Geneva (Switzerland) International Exhibition.
- Oct. 5-14—Leipzig (Germany) Exhibition, Krystall Palast.
- Nov 1-16—Berlin (Germany) Automobile Exhibition.
- Nov. 15-24—London, Olympia Motor Show.
- Nov. 23-Dec. 1—London, Stanley Show, Agricultural Hall.

Tours.

- May 6...—Targa Florio Tour (Sicily), Auto Club of Milan.
- May 12-13—International Light Touring Car Competition, Vienna to Gratz and back. Austrian Automobile Club.
- May 13-14—Tour de France. Motorcycles and voiturettes.
- May 15-16—Le Coupé d'Or and International Automobile Congress, at Milan, Italy.
- June 5-13—Herkomer Cup Touring and Speed Trials, Munich, Bavaria.
- June 11-16—Land's End to John O'Groats. Auto Cycle Club of Great Britain.
- June 18-16—Scottish Reliability Trials.
- July 29-Aug. 15—Circuit Européen, 3,000 miles, Paris, Milan, Vienna, Berlin, Cologne, Paris.

Race Meets and Hill Climbs.

- May 27...—Motor Cycle Club of France Championships.
- June 26-27—Le Grand Prix, Sarthe Circuit, France.
- June 29...—International Cup Race for Auto Cycles, Austria.
- July 15...—Suse-Mont Cenis Hill Climb (Italy). Automobile Club of Turin.
- Aug. 1-15—Circuit des Ardennes (Belgium).
- Aug. 15-16—Ventoux (France) Automobile Meeting.
- Aug. 14-19—Ostend (Belgium) Meet.
- Aug. 23...—Semmering Hill Climb.
- Sept. 27...—Tourist Trophy Race, Isle of Man, Auto Club of Great Britain.
- Oct. 7...—Chateau Thierry (France) Hill Climb.
- Oct. 28...—Gallion (France) Hill Climb.

EUROPEAN CIRCUIT WILL BE GREAT EVENT.

PARIS, April 10.—The exact route to be followed in the European Circuit has just been made known by the Commission des Concoars, the committee having the general charge of arrangements. The total distance to be covered is 4,648 kilometers (2,905 miles), divided into fifteen stages, as follows:

First stage: Paris-Limoges, Thursday, July 26, 246 miles.
 Second stage: Limoges-Toulouse, Friday, July 27, 202 miles.
 Saturday, July 28, exhibition at Toulouse.
 Third stage: Toulouse-Nîmes, Sunday, July 29, 216 miles.
 Fourth stage: Nîmes-Grenoble, Monday, July 30, 155 miles.
 Tuesday, July 31, exhibition at Grenoble.
 Fifth stage: Grenoble-Milan (Milan), Wednesday, August 1, 244 miles.
 Thursday, August 2, exhibition at Milan.
 Sixth stage: Milan-Padua, Friday, August 3, 156 miles.
 Seventh stage: Padua-Klagenfurt, Saturday, August 4, 172 miles.
 Eighth stage: Klagenfurt-Vienna, Sunday, August 5, 191 miles.
 Monday, August 6, exhibition at Vienna.
 Ninth stage: Vienna-Prague, Tuesday August 7, 185 miles.
 Tenth stage: Prague-Breslau, Wednesday, August 8, 170 miles.
 Eleventh stage: Breslau-Berlin, Thursday, August 9, 203 miles.
 Friday, August 10, exhibition at Berlin.
 Twelfth stage: Berlin-Hanover, Saturday August 11, 186 miles.
 Thirteenth stage: Hanover-Cologne, Sunday, August 12, 226 miles.
 Monday, August 13, exhibition at Cologne.
 Fourteenth stage: Cologne-Rheims (France), Tuesday, August 14, 244 miles.
 Fifteenth stage: Rheims-Paris, Wednesday, August 15, 99 miles.

In addition to the exhibitions which will be held at the six different towns en route, each one lasting for a day, fêtes and various entertainments on a large scale will be held in every town in which the competitors pass a night. The tour, indeed, will make a line of gaieties throughout Europe. At the present moment members of the committee are traveling round the circuit making all necessary arrangements for the contest. Competitors' luggage and their letters will be sent after them day by day, hotel accommodation will be provided for them in advance, direction and danger posts will be placed wherever necessary over the circuit, and every provision made for the comfort of travelers. Twenty-one cars are now entered, but this number is certain to be more than doubled before the closing of entries on April 20, and it is probable that over fifty automobiles will be in the tour.

Commenting on the event, the *Motor Review* has the following description of the route:

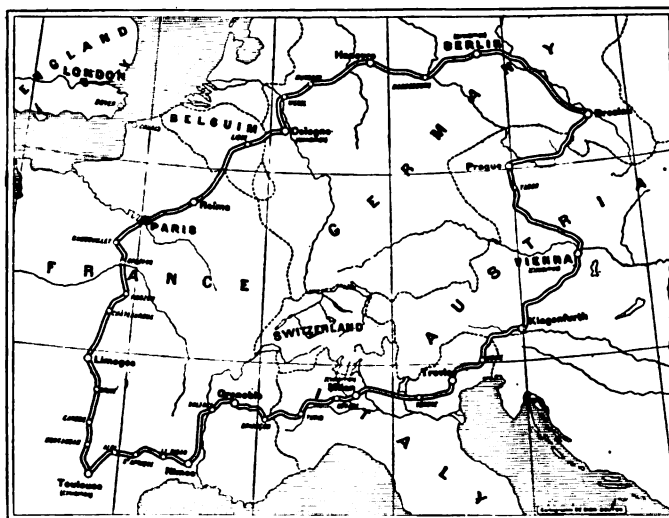
"All other events of a similar kind will 'pale their ineffectual fires' before this long and difficult run, through which few cars will come successfully unless they are thoroughly prepared for the trial. As for the small cars it is difficult to see what they can do at all in a contest of this kind. On the first day the cars will run from Paris to Limoges by way of Orléans, Vierzon and Châteauroux, a distance of 243 miles. As the roads are remarkably good over this stage the distance is nothing for the big cars capable of doing from 25 to 35 miles an hour, but the small cars would take more than one round of the clock to accomplish the journey. On the second run from Limoges to Toulouse the roads are again excellent and, after the first stage, will be easy enough, while the day's exhibition of competing cars at Toulouse will give competitors a well-earned rest. There is good going from Toulouse to Nîmes by way of the fine old city of Carcassonne, but in July the hot southern sun and the flinty roads will put very hard work on the tires when the fully laden cars are being driven at top speed. Those who do not know Nîmes will leave this interesting old city with regret, and up to Valence they will find the going a repetition of that of the previous day, but on to Grenoble the difficulties of the trial begin for the smaller powered vehicles, while even the big cars will leave the engines severely tested by constant acceleration on the long winding mountain roads of the Dauphiné. Then from Grenoble to Milan the road is long and terrible—a road of 250 miles over the Lauterets, up Mont Cenis

to an altitude of nearly 7,000 feet, and then down again to Suse; along the difficult road from Suse to Turin, and the frightfully bad road full of holes and ruts from Turin to Milan.

"The day's rest at Milan will come as a relief. Then follow the comparatively easy stages across Italy into Austria, from Milan to Padua, and from Padua to Klagenfurt. After this the competitors will find themselves fighting the natural obstacles of the road from Klagenfurt to Vienna when, for more than 200 miles, they will be traveling over roads for the most part bad and narrow, with gulleys and ridges traversing them, and, to crown all, the climbing of the Semmering to terminate the journey.

"Most of the difficulties will now have been overcome, and with a day's rest at Vienna competitors can look more hopefully to the second half of the tour, for those who have come through successfully so far may consider that the victory is more than half won. It is true that the going from Vienna to Prague is bad, but the journey is comparatively short, and the road improves from Prague to Breslau and Berlin, when there will be another day's rest.

"From Berlin to Hanover the 180 miles journey presents no particular difficulty, but the much longer run from Hanover to



MAP OF THE ROUTE OF THE EUROPEAN CIRCUIT IN AUGUST.

Cologne takes in a number of big towns through which the vehicles will have to travel slowly, and it will be a long day's run, although the exhibition at Cologne will provide competitors with a rest. From Cologne to Rheims there is another stage of 250 miles, which practically terminates the trials, for the run to Paris will be merely in the nature of a procession. What proportion of cars will come through such a test with a clean sheet? We doubt whether a single one will be able to do so, but the mere fact of finishing such an arduous tour under the conditions imposed will be enough to prove the sterling qualities of the vehicles."

The Road Club of the British Isles.

A beautifully printed prospectus, telling the aims and objects of this newly organized body, has been received from the Hon. Secretary, Eden W. Paget, Esq., whose offices are at 8 Clarges street, Picadilly West, London. The club has been established to meet the requirements of automobilists and other motorists driving tourists, hunting and coaching people and others of both sexes, who desire to pursue the pastime of road touring under more favorable conditions than have hitherto prevailed in the British Isles. Full particulars regarding membership can be obtained by addressing the honorable secretary.

WOMEN AS DRIVERS OF AUTOMOBILES.

By MRS. A. SHERMAN HITCHCOCK.

IN these days, when the adoption of the automobile is becoming universal, it is an interesting and noteworthy fact that women, who as a rule have no mechanical training, can perfect themselves, in a comparatively short time, so that with perfect safety they can successfully manage, unaided, the large touring car; this has been proved almost conclusively during the past year, for the cars now owned and operated by women are many.

Automobiling has become the favorite pastime and pleasure of the fair sex, and they are coming more and more to understand the workings and mechanism of the motor and to learn more of its capabilities and necessities.

The time has passed when a woman driving a gasoline car is regarded as a curiosity. It is, of course, difficult to prognosticate, but it seems safe to say, that each season we will see more women who possess the ability to thoroughly master the science of mechanics, acquire the knowledge of the intricacies of the motor and familiarize themselves with its working features. Women are not, as a rule, fitted temperamentally to find the study of mechanics an easy one, but a proper understanding of any unfamiliar subject is only to be gained by systematic work in accordance with a desire to become proficient, and the woman who intends driving her own car, and make a success of it, should apply herself diligently to the study of the gasoline motor. Women have no other outdoor pursuit that can compare with automobiling. Everywhere the automobile is a diversion. It opens up new possibilities; domesticates speed and gives us increased independence.

The distance that can be traveled, the flexibility of speed, the physical exhilaration without physical exertion, is all conducive to the greatest fascination, and whether one has been an enthusiastic cyclist or a lover of the horse, nothing can equal the automobile if speed and a maximum of comfort are a desideratum.

A woman to be a successful driver should be possessed of cool nerves, a level head, courage and determination. She must have perfect confidence in herself, be ever alert and calculative, and quick of application in case an emergency should arise where instant action would be necessary. Practical experience is of far greater value than a theoretical study could ever be, and a break-down upon the road will be an effectual lesson.

Out upon a country highway, inconveniently far from expert aid, the automobilist is wholly dependent upon knowledge she may possess to avoid delays, and there is nothing more vexatious than to be subjected to long waits on account of repairs. No automobile, however well made, will run surely and indefinitely by merely handling a steering wheel and levers; it must be cared for and provided with the necessary materials and lubricants. The first things to be learned are to steer the car, the use of the

spark advance, speed clutches and throttle and the immediate action of these parts upon the motor.

Missing of explosions and even the complete stalling of a gasoline motor may occur as the result of trouble in the ignition system, and if the engine stops suddenly it can usually be attributed to an ignition fault. In most cases the trouble is something quite simple and easily overcome, and when one is in the experimental stage they should look their car over carefully and see if they cannot locate it without calling expert aid. If, however, an expert has to be called, his work should be carefully watched, and one should insist upon knowing the whys and wherefores, so that, should similar trouble arise, they could avoid the humiliation of acknowledging their ignorance of the car they are driving, and which they certainly would be expected to intelligently understand.

The spark and gasoline are two all-important factors to be thoroughly understood; they are the chief trouble brewers and cause more or less bother for the beginner. One of the essential

lessons is operation of the spark advance, so as to obtain the best results in speed and power. Be careful to feed neither too much nor too little gasoline, for the secret of a perfectly normal running motor lies largely in the flow of gasoline. Misfiring will result from sooty spark plugs, or an exhausted battery supply. To clean a spark plug an old toothbrush and a few drops of gasoline are all that is necessary, but a better way is to always carry one or two extra plugs which may be substituted for the one that has become ineffective.



ONLY TO INQUIRE THE WAY—MISS ELSIE JANIS OF "THE VANDERBILT CUP."

A highly important thing to be strictly adhered to are road rules. If a woman has been accustomed to drive any vehicle she will be familiar with these rules, but if not, it is a duty she owes to herself and others to become thoroughly familiar with them. Many disastrous and serious accidents result from ignorance of road regulations. The car should always be under complete control, and caution be used in congested places.

There are dangers in everything we attempt, whether it be labor or play, but with the exercise of due care one is as safe in an automobile as anywhere else. Many a pleasant hour can be spent by the motor-loving woman, and one of the greatest fascinations is derived from the independence that is afforded and which can be enjoyed by no other means of travel. The pleasure and satisfaction is great in mapping out and exploring localities before unknown, or visiting points of interest that have hitherto eluded desire. The number of women driving their own cars has been greatly increased, and will be still more so as they realize the real pleasure to be derived from actually operating the car themselves—the feeling of power, exhilaration and fascination which cannot be equaled in any other way.

THE DOINGS IN AUTOMOBILE CLUBDOM.

CLEVELAND, April 16.—Asa Goddard, the recently-appointed secretary of the Cleveland Automobile Club, has started on a very energetic campaign to improve road conditions in this section of the state. His first work will be in the erection of guide posts along the main east and west highway as far west as Fremont, and as far east as Conneaut, or the state line. The Buffalo club will take up the work east of the state line, while the Toledo club will probably arrange to place guide posts west from Fremont.

The design for sign post originated by Mr. Goddard consists of a metal arrow about 30 inches long by 8 inches wide, with a light blue enamel background and white letters. This is a combination which can be seen at a considerable distance and contains the name of the indicated city or town in large block letters, with the distance and the club emblem.

Mr. Goddard expects to spend a good portion of his time in agitation of the good roads question through the press, and by means of lectures, and through the co-operation of the newly-formed Ohio Automobile Association he hopes to bring about a change in the state highway improvement laws. Under the present system the state is making an appropriation of \$150,000, which is equally divided among the various counties. The counties do the road work and charge a portion of the expense direct to the abutting property owners. Usually the property owners work out their tax by putting in their odd time at "road improvement," and the usual practice of farmers is to plow up the side of the road and throw the sod and dirt into the center, making conditions worse than before.

The practice in Mr. Goddard's home state, Massachusetts, is much superior to Ohio's. During the past eight or ten years the old Bay State has appropriated about \$500,000 annually to road improvement. The fund is in the hands of a commission and the improvements are made according to their ideas in the portions of the state which most require it. After a road has been built it is maintained by the state and is kept up in first-class condition. One-fourth of the cost of these state roads is assessed upon the county, but nothing is charged directly to the abutting property owner. There are about 800 miles of these roads in Massachusetts, and the number of miles is yearly increasing.

Oregon Automobilists Energetic for Good Roads.

PORTLAND, ORE., April 3.—With the coming of spring weather automobilists are out in force in this city and vicinity, for the atmosphere is clear and the sun shines each day with the regularity of the conditions in the month of August, which serves to promote the fever of speeding into the rural districts.

Some of the most enthusiastic autoists are working up interest in the proposal to hold a meeting of the Portland Automobile Club for the purpose of expediting the good roads movement, now being fostered with considerable activity by that organization. Their efforts will undoubtedly prove successful, for the reason that the movement is experiencing one of the greatest agitations in the history of Multnomah county, as well as all over the state. This state of affairs has been brought about by the concerted efforts of a few members of the Automobile Club, who have been ceaseless in their endeavors to secure the improvement of all thoroughfares leading to Portland and nearby places of interest.

Some of the roads in this state have been left in execrable condition after the winter's heavy travel. They have been cut up into ruts and quagmires by the passage of heavy logging teams and kindred vehicles, hauled into the timber belts for the

opening of work in the spring, and the few that had been made fairly passable last summer are now much worse than ever.

Some of the local horsemen are prone to object to the automobile, and have shown themselves willing to foster any movement that will serve to curb the industry, but fortunately they do not represent a majority of the local sportsmen. The greater number of fair-minded citizens realize that the automobile has come to stay and that the industry should be encouraged. With this idea in mind, they have joined the autoists in the promotion of the good roads movement.

Nebraskans Against Reckless Driving.

OMAHA, NEB., April 16.—New officers were elected and resolutions adopted denouncing fast and reckless driving at the annual meeting of the Omaha Automobile Club. Part of the resolution is to the effect that it shall be the duty of all members who see or know of reckless driving to make a report to the chief of police and ask that complaints be filed against the offenders. The club adopted a plan whereby each member carries an order signed by the chief of police, directing any officer arresting the bearer to accept the card as bail and release the autoist, who in turn promises to appear in police court to answer the charges. The idea is to strengthen the club and make it unnecessary for members to be taken to the police station and furnish bail in case of accidents or untoward events.

The new board of officers are: President, Dr. F. N. Conner; first vice-president, C. Brown; second vice-president, J. F. DeJarnette; secretary, E. L. McShane; treasurer, Emil Brandeis; board of directors, Harry L. Cummings, Gould Dietz and Louis C. Nash.

Secretary of State Galusha has received information that the county attorneys of Douglas and Lancaster counties, in which Omaha and Lincoln are situated, are permitting automobile owners to use their cars without complying with the state laws regarding registration. He is preparing to devise a means of enforcing the law and has requested the county attorneys to assist him. It is their duty to comply with his requests.

The Plans of the Minneapolitans.

MINNEAPOLIS, MINN., April 16.—For another season at least the Minneapolis Automobile Club will make its headquarters at the Plaza Hotel. At the fourth annual meeting of the club it was decided to rent the basement rooms of the hotel, fronting on Kenwood parkway, for one year, at \$100 per month. In these rooms, under the immediate direction of a house committee of five, the club will establish billiard rooms, an information bureau, card room, smoking room, and buffet. In addition to the accommodations which the club may provide for itself in the rooms reserved for it, the members of the club will have all the privileges of the hotel. The election of officers for the ensuing year resulted as follows: President, Frank M. Joyce; vice-president, Asa Paine; treasurer, John Riheldaffer; secretary, R. J. Smith; trustees, Dr. C. E. Dutton, E. J. Phelps, Horace Lowry, W. F. Brooks, and F. W. Commons. During the year the secretary reported that the membership had increased from 168 to 359.

A. C. of Pittsburgh Will Assist.

PITTSBURGH, April 16.—Pittsburgh has a new Director of Public Safety. It is Frank Ridgway, who for years has "made" the weather of this vicinity. Already he has his eyes on the automobilists. In the midst of the dazzling Easter crowds yesterday could be seen dozens of six-foot special policemen stationed on all the principal auto speedways armed with stop watches and

with orders to arrest every speedy chauffeur. Director Ridgway, who is backed by the Automobile Club of Pittsburgh, in his attitude will see that every offender arrested will get a severe penalty without delay.

Savannah Automobile Club After Roads.

SAVANNAH, GA., April 16.—At a recent meeting of the Savannah Automobile Club, a committee was appointed to confer with the road commissioners of Effingham county, with the object of securing better highways. The plan is to secure a good road from Savannah to Augusta, which will cross Chatham, Effingham, Jenkins, Burk, and Richmond counties. There are long stretches of the road now in excellent condition, and the improvement of the connecting links between these stretches is what is desired.

Peoria Club Joins the A. A. A.

PEORIA, ILL., April 16.—At the annual meeting of the Peoria Automobile Club held April 9, it was decided to join the Illinois State Automobile Association, which is affiliated with the American Automobile Association. The club now numbers 85 members. The annual election of officers resulted as follows: President, B. H. Onken (re-elected); secretary, R. A. Whitney; treasurer, W. H. Rees. It is the intention of the club to hold a race meet in Peoria during the coming summer, the date to be named later.

The Chicago Automobile Club's New Home.

CHICAGO, April 16.—The Chicago Automobile Club has closed a lease of the property at 13-17 Plymouth court, that city, from the National Life Insurance Company, for 99 years from January 1, 1906, at an annual rental of \$4,000 for the first year, \$8,000 for the next four years, \$9,000 for the next five years, and \$10,000 for the next 89 years. The site will be used for the new clubhouse which will be constructed at a cost of \$150,000.

CLUB DOINGS IN GENERAL.

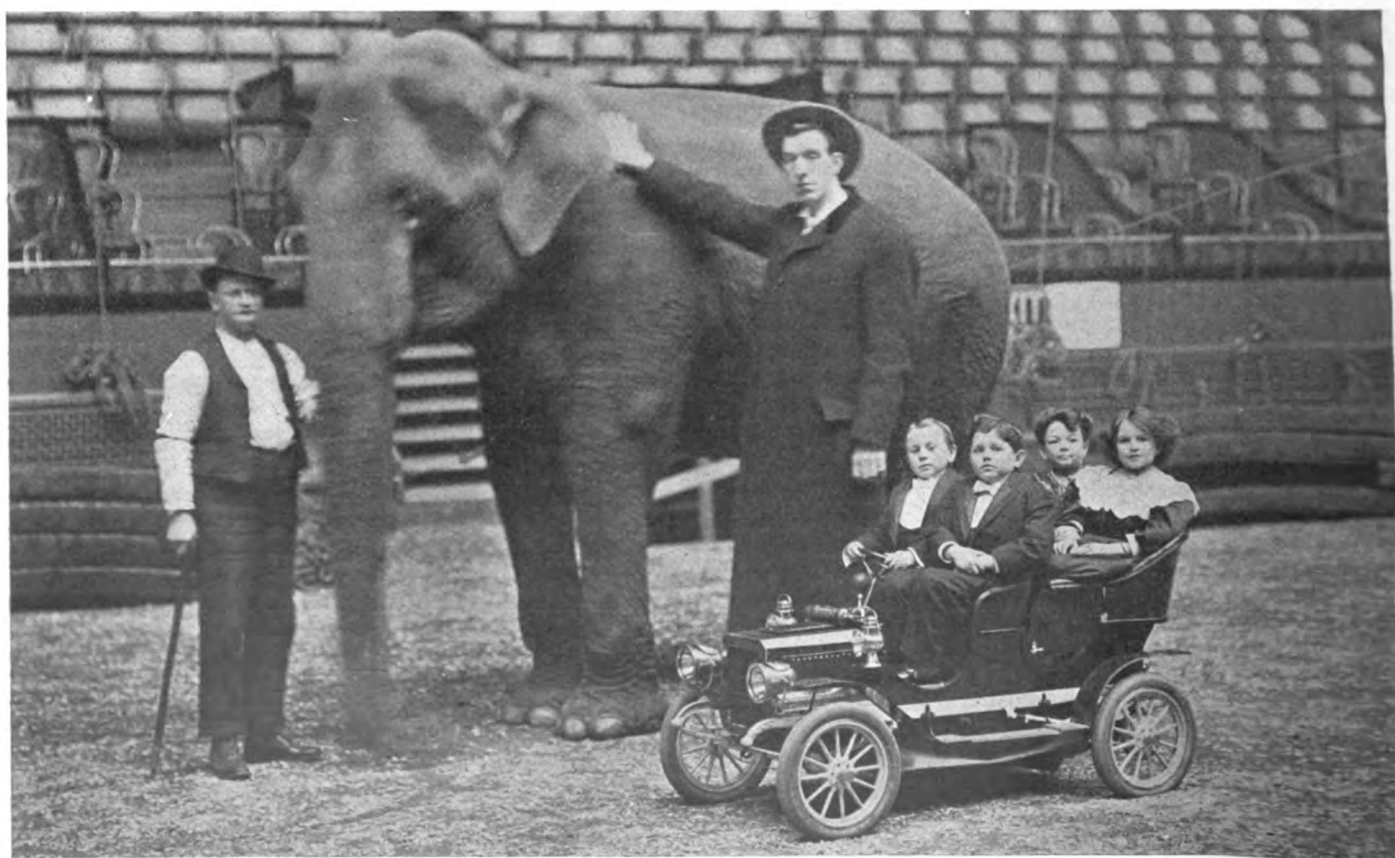
FOND DU LAC, WIS.—An automobile club is in process of formation here and a meeting of automobilists has been called to effect a permanent organization.

NEW YORK.—Until the new club house now in course of erection on West Fifty-fourth street is completed, the Automobile Club of America will occupy rooms on the top floor of the Plaza Bank building, at Fifth avenue and Fifty-eighth street. The club's lease of its present quarters on the first floor expires on May 1.

CHICAGO.—The Austin Automobile Club, a flourishing suburban organization of Chicago, held its regular meeting Tuesday, April 17, at which time several well-known automobilists addressed the club. At present the membership numbers 87, but the officers expect to have 150 by the first of June. Ex-Alderman J. H. Francis is the president.

CORRY, PA.—The Corry Motor Club was organized on April 12 with a board of governors as follows: Wm. E. Steele, Eli Barlow, W. Ed. Marsh, Louis E. Brown, H. M. Norton, and George H. Crippen, who met and elected the following executive officers: President, Wm. E. Steele; vice-president, Eli Barlow; secretary and treasurer, W. Ed. Marsh. The club will join the Pennsylvania State Federation at once.

CINCINNATI, O.—A leading feature of the Clean Streets Convention held in this city the week of April 9-14, was the automobile parade on the opening day. Valentine Duttonhoffer, Jr., president of the Cincinnati Automobile Club, was in charge of the parade, which was in four divisions and largely attended. The cars were all gayly decorated with American flags and the city's official banner, and each automobile bore a sign indicating the commercial body it represented. The streets along the line of parade were cleaned by the new flushing machines sent to Cincinnati for the purpose of displaying their usefulness during the convention.



COL. AUGER, THE WELSH GIANT, "JUMBO," AND THE LILLIPUTIANS IN THE BABY REO, ALL OF THE BARNUM & BAILEY SHOW.

IGNITION SYSTEM FOR GASOLINE MOTORS.

By CLARENCE B. BROKAW.

TO judge from the claims of different makers it would appear that there are numerous varying systems of ignition, whereas all can be reduced to two general branches—the make-and-break spark and the jump spark. We will take up the former first, but before doing so it is of interest to look back a few years and see why this form of ignition was not developed earlier in the history of the car. Many experimenters adopted this system from the outset, and its peculiarities proved so puzzling and its shortcomings so numerous, at that time, that it is hardly to be wondered at that its popularity suffered a serious decline and that it was not resurrected for two or three years. Further along I will refer to the causes of this seemingly inexplicable abandonment and revival of the system in question.

The Make-and-Break System.

As its name indicates, in this system the circuit must first be completed or made and then broken before the spark is obtained. A very natural question arising on this point is, Why in the make-and-break system does the spark occur at the break and in the jump system upon the making of the circuit? It is a question that entails an explanation of the form of coil used with this system—a simple-wound, highly self-inductive coil. It consists of but one simple winding of heavy wire upon a core composed of a bundle of soft iron wire, the object of which is to obtain as rapid magnetization and demagnetization as possible. To achieve this end each wire is shellacked separately before all are bundled, and in consequence each acts independently of the other, thus preventing false or eddy currents being generated in the core itself. Steel could not be used for the purpose, because, once magnetized, it would remain so. Now when the circuit is made through this coil, by the hammer descending upon the anvil of the plug, there is no sign of current whatever. The potential of the current is not sufficiently high to cause it to jump to the hammer before it actually makes contact, and as an appreciable interval is required to saturate the core of the coil magnetically it does not act until the circuit has actually been made momentarily. By self-induction is meant the induced current that is set up in the coil through setting up lines of force in its core by rendering it magnetic. When the circuit is suddenly broken an almost blinding flash follows, even when only a few dry cells are used, caused by the dying magnetic field cutting the copper wire that is wound around the core. The strength of current produced depends upon the density of the magnetic field and the rapidity with which a wire cuts through the field or the moving magnetic field cuts the stationary wires. Not alone the battery current, but the far heavier induced current, attempts to follow the hammer when it leaves the anvil, and this results in the very heavy spark. Of course the latter is not as large by any means when made in the motor cylinder, owing to the much higher compression.

This is one of the chief claims of the advocates of the make-and-break system—the greater size or volume of the spark—and there is certainly considerable foundation for the contention. In fact, it is my firm belief that the adoption of a system of double ignition, that is, two plugs sparking simultaneously in different parts of the combustion chamber, would provide a means of materially increasing the power, for the reason that the time element is a factor in ignition the importance of which is seldom realized. To illustrate, if we had here a string of the granules of slow-burning powder such as is at present universally used in high-powered guns, and light it at one end with a match, it is easy to see that it will not burn as rapidly as if it were lighted simultaneously at both ends, or, again, at three different points; but holding three burning matches at one end would not facilitate the process in the least. If we can cause the explosive mixture in the combus-

tion chamber to become thoroughly ignited before the piston has had an opportunity to start outward on its power stroke there is that much gained, for the greatest strength of the blow will be delivered at the maximum pressure. But if the maximum force of the burning mixture is not generated until the piston has descended one-fourth or one-third of its stroke, which in a modern motor means little more than an inch, there is that much power lost.

This is an apt illustration of the necessity for advancing and retarding the spark; the more it is advanced up to certain limits the greater the power. A car will often climb a hill with the spark advanced as much as possible, provided the engine maintains its speed, but if the advance is too great the engine begins to pound and labor, because the force of the explosion is taking place, at least in part, before the piston has passed the dead center, and the stored energy of the flywheel and the power of the new explosion clash. If we could cause the explosion to take place more rapidly there would be no necessity of advancing the occurrence of the spark to a point just short of where it causes the engine to pound, and still obtain a better result than is at present the case. An engine that pounds on a hill or slight grade can often be made to run quietly by adjusting the carbureter so that the engine receives a richer mixture.

To come back to the make-and-break system, another strong contention of its advocates is that no amount of oil can foul its plug, because the blow of the hammer spreads it and the heat of the flash will effectually burn it away in every instance. Nor can the plugs shortcircuit, because its electrodes are such a distance apart that there is very little possibility of sufficient carbon forming between them to provide a path for the low-tension current. That is all very true, but it must not be taken too literally, because here, where the insulated electrode protrudes through the metal base, there is an extremely short distance between two current-carrying portions of the plug and the formation of a comparatively small amount of carbon about the base of this leg is sufficient to bridge the gap between them and cause a short circuit.

Another shortcoming of the plug itself is the liability of its points to wear away or break loose. This causes the gas to explode in the different cylinders when the pistons are not relatively in the same position, and makes the motor run unevenly. Platinum is, of course, the best metal to use for contacts here, but such a comparatively large piece is required and the expense is so great that nickel or steel is more often employed. There is considerable wear, though nothing compared to what this was in old-time plugs. Should you ever be caught on the road with a plug that has become defective on this account, it is not an exceedingly difficult thing to remedy. For lack of a piece of nickel or platinum, silver will serve equally well. There are occasions when it is justifiable to mutilate Uncle Sam's coin, and nothing is better than a dime. Pound it out a little thinner and cut a piece of the size required. Brighten the surface of the plug hammer with a file and solder the silver to it. For this purpose cyanide of potassium should be used as a flux. It is a deadly poison and must be handled carefully, but it is possible to obtain it at almost any drug-gist's. A blow torch is the only other requirement, and there are few country tinkers who cannot supply this. Where borax is used as a flux it tends to form in small balls between the silver and the iron and prevents making a good joint.

Moreover, the shortcircuiting of a single plug of this system renders the engine useless for the time being, whereas with the jump spark it is possible to run the engine on three, two, or any one cylinder while testing the others for the breakdown. It is thus a more difficult matter to locate a fault in the make-and-break system where this is brought about by the short circuiting of a plug, as it is not so easy to put your hand on the particular plug that is causing the trouble. Then, again, I have found that

*From a lecture delivered before the Automobile Club of America in New York, March 27, 1906.

accurate timing of the occurrence of the spark in each cylinder forms more of an element upon which success is dependent in this system than in the jump spark.

For instance, cylinder number three follows number one in the order of firing, but through a faulty adjustment of the push rod of plug number one, or for any other reason, the circuit is not broken here until it is made by the coming together of the hammer and anvil of plug number three, it is evident that no spark can occur in number one and that cylinder will miss. In other words, one plug is literally robbing the other of its spark and it constitutes a fault that is more or less difficult to locate.

As to the purely mechanical side of the make-and-break system—that is, the necessity for a camshaft, cams, push rods and springs—I need hardly say anything. They are considered an insuperable obstacle to the adoption of this system by some and by others are regarded as entailing no more complication than the timer and coils of the high-tension system.

This brings me to the subject of the coil used with the make-and-break system, which I have already described in detail. But one coil is necessary in series with the source of current for any number of cylinders up to four. It is found, however, that at very high speeds the action of one of these coils is not sufficiently rapid to permit of its demagnetization before the occurrence of the next impulse, so that in some instances two coils are used, and I believe that this will be necessary on the new six-cylinder engines of the Mercedes racing cars, otherwise the jump spark system would have to be used. The only thing left to be considered in connection with this system is the source of current supply, and the inability to obtain anything satisfactory for this most essential part of the service was what led to the abandonment by the majority of builders of the make-and-break system early in the history of the automobile movement.

Batteries.

First there is the battery, and by this I mean specifically the primary cell of which the dry type was almost universally used in the beginning. As it is necessarily composed of a number of units, owing to the fact that it gives but 1.5 volts per cell, it provides a number of sources of trouble in the numerous connections likely to come loose. But far more troublesome is its tendency to polarize. This is a peculiarity of the dry cell that has caused many of us to discard a good battery and replace it with a brand new one simply because we did not recognize the symptoms. Before we had gone thirty or forty miles with a dry battery, and a make-and-break system of ignition, the battery had ceased to act, and the only reasonable conclusion appeared to be that it was dead. But it was merely polarized, and, if given an opportunity, would recuperate and be practically as good as new.

In the working of any chemical primary cell hydrogen gas is generated and the bubbles attach themselves to the positive or carbon element of the cell. It will continue to produce a current in spite of a certain amount of this gas, but once the surface of the carbon plate is entirely covered with hydrogen bubbles the cell is polarized and ceases to act. This is the result of keeping it on closed circuit too continuously, and the only thing needed is a rest to bring the cells back to their normal productive condition. For this reason the dry cell is very expensive and entirely unsatisfactory with the make-and-break system. It polarizes too quickly.

Then there is the accumulator or storage battery. While this is a vast improvement over the dry cell in its greatly increased amperage, it is likewise an expensive source of current to employ in connection with this system; the demands for current are entirely too great and the storage battery would need recharging far more often than would be convenient or practical.

Both the dry cell and the accumulator will give satisfactory service, and are doing so in thousands of cases, but I consider the storage battery very much superior, for a number of reasons, chief among which are its much greater amperage, small number of connections to give trouble and ease of maintenance. No matter which form is used, an extra battery should invariably be

carried as a reserve, and, in the case of dry cells, they should be used alternately, switching over to the fresh set the moment the ones in use show signs of weakness. This should never be done with the accumulator; always use one set until it is exhausted; and this can be ascertained by testing each cell with the voltmeter. If the voltage has dropped to 1.7 per cell, further use of that battery will be apt to ruin it. It should be recharged as soon as possible, as standing in this condition will also cause it to deteriorate rapidly. When the dry cells are suspected of giving out they should be tested with an ammeter. It is useless to test them with a voltmeter, as they will usually give a reading of 1.5 volts, whether fresh or old, and their potential is seldom an indication of their condition. Failing an ammeter, they may be roughly tested by momentarily short circuiting with a piece of wire and judging their state by the size of the resulting spark. Should neither set be fully active, both sets may be coupled in series-multiple, thus giving the amperage of both sets at the same voltage as previously. When new a dry cell should show 22 to 25 amperes on test and the buyer should always insist upon this in order to prevent having palmed off on him some that have been standing on the shelf indefinitely.

Never, under any circumstances, attempt to test a storage battery in this manner, as you will, in all probability, ruin it by causing it to give up its entire capacity of current at one instantaneous discharge, which is so hot that it will burn up any small piece of metal. Test the condition of storage batteries with a voltmeter. About 2.25 volts per cell indicates that they are fully charged.

As to the connections, always use flexible cable for wiring the ignition system of any car. Copper changes character very rapidly under the influence of vibration, and a solid wire will readily become brittle when subjected to constant shaking. In fact, it will become so very brittle that it will snap off at the slightest provocation, leaving the insulation, to all appearances, just the same. There will be practically no indication of the location of the break in the wire, which can only be discovered by putting it to a bending test. Bend over every inch or so until the rupture is reached and the latter will then be apparent. For this reason do not use solid wire, as it is bound to cause trouble sooner or later. A cable is composed of a number of very fine wires and is as flexible as a piece of string. It is not harmed by the vibration and is not so apt to break, but care should be taken to gather all the separate strands together and solder them or fasten them in a terminal, as one of these hair-like wires straying about may prove a prolific source of trouble not overeasy to locate.

The Magneto.

As we have already seen, neither of the forms of battery in general use is capable of supplying sufficient current to make it a practical source of supply for the make-and-break system. This is what caused the almost universal abandonment of the latter and its subsequent readoption when the magneto was taken up. The low-tension magneto in construction is simplicity itself. A bank of compound permanent magnets composes the field. They are made of a peculiar quality of high-grade steel. Tungsten steel is generally employed on the Continent, as it is noted for its capacity to retain an unusual degree of magnetism. They are very highly magnetized and semicircular cast-iron pole pieces are affixed to their poles so as to encircle the armature. The armature core is an H-shaped piece of cast iron, upon which there is a single, simple winding of comparatively coarse wire, one end of which is led out through the hollow shaft of the machine to a metal terminal on its end, against which a collector brush presses. The other terminal of the coil is grounded, and this leads me to make another digression on the subject of grounded connections, for I firmly believe that if the grounded connection in ignition system wiring were either discarded entirely or had more attention devoted to it there would be far less trouble.

For instance, a battery is located under the driver's seat of the car. The most convenient place to make the ground connection is on the frame in close proximity. From here the current has to find its way to whatever may happen to comprise the ground connection of the distributor, and its course may have

to pass through rivets and joints in the metal, and occasionally through bearings; and the better the bearing, the poorer conductor will it make, for there will be a film of oil between it and its shaft and there will be little actual metallic contact. The same is true of the secondary circuit, although in this case the greater voltage of the current will enable it to bridge gaps and pass through or over obstacles that would break the primary circuit. It should always be the object in wiring up a car to see that these ground wires are led as closely as possible to the point from which they are to return the current, and the metal drilled and tapped to insure a good, firm connection.

To get back to the magneto: when the armature is in this position or straight across the poles the magnetic circuit is complete, the lines of force flow through it uninterruptedly and there is no voltage. Whenever you withdraw the armature always place a piece of iron or steel across the poles to prevent the loss of magnetism. Giving the armature a quarter turn to the right, in case the machine is connected to run in that direction, brings it to a point where it is cutting the maximum number of lines of force and the wave of alternating current reaches its peak or greatest value. That is, when a line drawn through the center of the armature would strike the corners of the diagonally opposite pole pieces. This is the point of greatest current flow, but it will be evident, for an eighth of a turn before, that it is approaching this maximum point and, for an eighth of a turn after, that it is receding from the maximum, so that within these limits it is possible to time the occurrence of the spark by advancing or retarding the movement of the armature to the extent indicated, and this is what is done. But on some of the cars using the make-and-break system with the magneto the spark is not advanced or retarded when under way. Provision is made for retarding temporarily in order to start the engine, but once running it takes care of itself, as the speed of the magneto naturally increases with that of the motor. It is not absolutely necessary that the magneto should be timed with the engine, as it can be geared to spin at a high rate of speed and thus deliver a constant alternating current, but this is not done usually.

A puzzling question for many students, and doubtless for many automobilists as well, is the difference between the low-tension magneto such as is used on the Locomobile, the Cleveland, Brazier and other cars and the high-tension magneto such as the Eisemann, Remy, the Lacoste and the Simms-Bosch. Electrically considered, there is no difference between the low-tension magneto and the Remy or Eisemann, for both of the latter are, strictly speaking, low-tension magnetos, although the systems in which they are employed are termed high tension.

On the Remy machine the magnets are equipped with the usual pole pieces made fast to the poles, but, in addition, the armature is surrounded by what is virtually another set of pole pieces and the latter may be shifted. The adoption of this set of shifting pole pieces obviates the disadvantage previously referred to—the fact that in the ordinary type of magneto advancing or retarding the spark meant causing it to occur before or after the occurrence of the point of maximum current flow in the armature with a consequent loss of efficiency. With the Remy movable pole pieces the spark may be broken at any time within a wide range of advance or retardation without losing the benefit of the maximum point.

To return to the matter of the difference between the two systems, this consists principally of the fact that the current generated by the magneto of the low-tension system is used directly as it issues from the machine, often without the intervention of a coil. In the Eisemann and Remy systems the current is passed through a powerful non-vibrating induction coil and then through a high-tension distributor made to run synchronously by gearing it with one to two pinions to the armature shaft itself.

"Apt to give trouble," you will immediately conclude, with regard to the high-tension distributor. If it were of the fiber and metal variety, with its rubbing contact, there would be trouble, and in a very short time. The constant rubbing together of the two surfaces produces an amount of fine metallic dust that is

sufficient to provide a path for the secondary current of 30,000 to 40,000 volts. With the aid of a little moisture (and sometimes without it) it would be converted into a mass of fireworks, for the secondary current would find its way all over it. In the Remy distributor there is no rubbing contact whatever. The collector revolves in front of the four contacts representing the plugs of the different cylinders, but does not touch them; there is an appreciable gap between them and the spark must leap it. This distributor finger, as I call it, is a fair-sized wedge or triangle, held at its apex, while its curved base revolves before the contacts. The reason for this is the necessity of making provision for advancing and retarding the spark. If the latter were occurring just as the near side of the triangle came under the contact point it is evident that it might be retarded but not advanced, so that when the magneto is timed to be in step with the engine the spark is made to occur just as the center of this wedge passes beneath the contact, and by this means fully thirty degrees of advance or retardation are provided for.

A question that often arises in this connection is, How does the spark occur in both the primary winding and at the secondary terminals simultaneously? As already indicated, the magneto is timed with the engine so that the current is taken from the armature just when the latter is at the position of maximum voltage and at the same moment the wedge-shaped collector is passing under the contact representing the terminal of the cylinder that is to receive the spark. The magneto is geared to run at the same speed as a four-cylinder engine and the distributor is geared down to half that speed, so that every time the collector sweeps by one of the contacts a spark bridges the gap. This is termed synchronous distribution, in that the functions of the magneto keep step exactly with the impulses of the engine.

The Lacoste and the Simms-Bosch are two magnetos in current use that are, technically speaking, of the high-tension type. The difference lies in the winding of the armature. The low-tension magneto armature has but a single simple winding, while in the Lacoste, for example, the armature contains both the primary (generating) winding, as in the case of the low-tension magneto, and also the secondary (transforming) winding. In short, the current is both generated and stepped up to the voltage necessary to spark at the plug right in the armature. A condenser completes this portion of the mechanism, and usually forms the protective cover for the armature, being encased in aluminum. The only remaining step that the current has to pass through before reaching the plug is distribution, and this is accomplished in practically the same manner as I have just outlined in connection with the Remy machine.

Condensers.

Undoubtedly the condenser is one of the least understood parts of any ignition system; and even the highest authorities vary as to just what its functions consist of.

The condenser stores electrical energy in the form of a static charge, and the simplest form of condenser would consist of two metal plates separated by insulation, which is known as the dielectric, regardless of whether it takes the form of air, glass, mica, wood or any similar substance. Paraffined paper in combination with sheets of tinfoil is most commonly used, as it is desirable to have as large an amount of area as possible consistent with small bulk. The sheets of tinfoil with alternate tabs are placed on each side of a sheet of paraffined paper, plain sheets of paraffined paper are placed between each two metal-covered sheets and the whole put together under pressure. One end of the circuit is led to one of the alternate groups of tinfoil ends and the other one to its reverse, so that there is actually no mechanical connection between the two sets of plates. When a sheet of the dielectric punctures, through an overcharge, then the condenser is ruined, as it will short circuit the primary.

Dielectrics possess a property termed specific inductive capacity, which may be compared with the elasticity of a membrane exerting pressure upon a column of liquid. The greater this elasticity the greater the amount of liquid which will flow for a given pressure. In measuring specific inductive capacity, air is taken

as a standard, and this capacity is defined as the ratio of the capacity of a condenser with a given dielectric to the capacity of the same condenser with air as a dielectric. If, for instance, it takes eight times as much current to produce a potential difference of one volt between two plates separated by mica, as it does when only air intervenes, the specific inductive capacity of the mica would be 8. The dielectric coefficient for paraffine which is used in spark coil condensers is about 2.02. The capacities of two condensers of the same dimensions, one using air and the other paraffine as the dielectric, would be the same provided the thickness of the paraffine be one-half that of the air separating the plates. If water flowing at high velocity through a pipe be suddenly shut off the inertia of the moving mass of liquid may be sufficient to burst the pipe. An electric current possesses something similar to inertia. Whenever the current changes in any way this inertia produces an electromotive force or pressure, termed self-induction, and the greater the number of electro magnets in the circuit the greater this force will be.

When the current is switched off the stopping produces a pressure tending to keep it going in the same direction; the more sudden the stoppage the greater the pressure, just as with a flowing liquid. When a circuit of considerable self-inductive capacity such as the primary of an induction coil is suddenly broken there is immediately set up a heavy electrical pressure tending to break down the insulation. As the circuit in the primary is broken at a high rate of speed by the trembler there is considerable self-induced current set up, and it would, unless diverted, rapidly burn up the contact points by forming an arc there, at the same time preventing the armature or trembler from making and breaking the circuit at anything like the requisite speed. The condenser is used to obviate this, and is connected in shunt with the trembler; when the circuit is opened the current rushes into the condenser instead of bridging the air gap at the points. When fully charged the condenser discharges itself back into the circuit, instantly demagnetizing the core, and produces an intense spark in the secondary circuit, thus aiding in the working of the coil in this manner besides. In fact, Sir Oliver Lodge, the English scientist, has devised a system in which a form of condenser, namely, Leyden jars, are used to cause the spark at the plug, and I believe this is the fundamental feature of the Holley magneto, which accordingly differs from all others on the market.

Coils.

Speaking of condensers brings me to the coil. The most important thing for the motorist to learn in connection with this essential of the system is how to properly adjust the trembler contact and how to guard against breaking down the secondary winding by imposing too great a strain upon it. To take up the first of these it is really marvelous to note the difference in the power on such small cars as the Olds and Cadillac single-cylinder machines that may be obtained by giving the trembler screw a quarter or half a turn. It is a matter of "tuning" the buzz of the trembler blade to a certain pitch, and an experienced ear is readily able to detect the fact that a coil is running too slowly. The object is to obtain as long a chain of sparks in the combustion chamber as possible, and to do this the trembler must vibrate at a very high rate of speed. Its note should be a high, evenly-maintained tone and it requires but a fraction of a turn of the screw to make its speed much too low, when the spark will not be repeated a sufficient number of times in the cylinder, or too high, in which case the action of the trembler becomes irregular. Learn to know your coils and by familiarizing yourself with the tone produced when they are working at their best, you will have little trouble on this score.

I will digress here for a moment, and add, learn to know just what each position of the spark advance lever on the sector at the steering wheel means in relation to the travel of the pistons in the cylinders and you will then be in a better position to take care of the ignition system.

With regard to guarding against a breakdown of the secondary winding of the induction coil, this is something much easier to

bring about than is generally imagined, and it entails a costly repair, as the secondary must be rewound. If for any reason a coil ceases to operate, do not attempt to test it without providing an outlet for the secondary current. Every time the trembler buzzes a current of enormously high tension (30,000 to 40,000 volts) is induced in the secondary, and unless an escape is provided for it, damage will result. If the gap between its terminals presents an excessive resistance that cannot be bridged by the sparking capacity of the coil, it must find its way out somewhere, and under these circumstances the path of least resistance will be through the insulation to the primary or through its own insulation—bad in either case.

According to the makers there are many forms of coils: three terminal, four terminal, and five terminal coils, also non-vibrator and vibrator coils. The two last really express the only fundamental difference, as the other terms merely refer to the number of connections provided to suit varying needs. If you ever find it necessary to test a coil in order to ascertain which are its primary and which its secondary terminals, bear the foregoing instructions in mind. If the secondary terminals be entirely unknown, as in the case of a five terminal non-vibrator coil, where binding posts seem to crop out all over it, do not repeat the test once you have found the primary terminals. In case it is of the vibrator type, which are usually easier to locate, always take the precaution to screw the trembler down tightly. There is then little danger in making the test. There is one more point with regard to coils, and that is whether it is preferable to use one or four with the four-cylinder engine, and from my experience I should say have four coils by all means. Less work is imposed on each one and it is accordingly less apt to give trouble and there is always that much more chance of getting home.

Plugs.

The spark plug is one of the few things connected with the automobile that has undergone scarcely any change for some time past. All those on the market at the present time are of practically the same design, the one point of distinction noticeable being the use of mica for insulation in some (the minority by the way) and of porcelain in others. Without prejudice, I must say that the mica will sooner or later absorb oil or moisture and permit the current to pierce it, no matter how tightly the insulation is pressed together. On the other hand, it is proof against breakage, which is certainly an advantage. That, however, is the only disadvantage of the porcelain plug.

There is one unusual plug in general use—that employed on the Cadillac cars. This is a plug with a direct return; that is, it has no ground return, but employs a double wire circuit. By this construction it is almost impossible for the plug to become short-circuited by carbon, because of the great insulated space between the spark points and the metal part of the plug, also because the secondary current has no reason to jump to ground to complete its circuit. There is one thing about it that is well to keep in mind, and that is, should one of these electrodes become short-circuited with the metal base, if it can be removed and the hole plugged the other point may be bent down close to the metal and it will spark just as well as ever, provided the other secondary terminal at the coil be grounded.

The Dynamo.

In conclusion I will merely say a word or two with regard to the dynamo, which has not been touched upon previously. In my experience I have found it is prone to break down, particularly by short-circuiting at the brushes and by a failure of the governor to check the speed when the latter becomes excessive. Where this year's model of the Apple ignition, set with a direct current generator and accumulators, with an automatic cut out in the circuit, is concerned, I have had no experience on a car, but from what I have seen of it in the course of demonstrating it before a class, I should say it will work very well. On the whole, I think the high-tension magneto of the Eiseman type, that is, a low-tension magneto with an induction coil separate, will, in the course of time, come to be almost universally used for pleasure car use.

HELPFUL TO THE MAN WHO DRIVES HIS CAR.

THE old adage, "that a stitch in time saves nine," is as applicable to the gears of an automobile as to anything else. To those car owners who are always kicking over the repair bill, a word to the wise should be sufficient. Few owners think it worth while to have their cars looked over by competent men until something happens which compels them to move it to the repair shop, and then they find to their cost that neglect in this direction has worked considerable damage to many of the parts. Any unusual sound on the part of the machinery should be looked after at once and not allowed to run, especially if the sound emanates from the gear case. Nothing is so destructive to the mechanism as a bad wearing gear, and should the trouble be allowed to proceed until the shaft lifts, the wheels will not mesh properly and the teeth will be ground away. It is better to take the ounce of precaution than to be forced to swallow the many dollars' worth of cure. Not only is the above advice applicable to the matter of the gearcase, but it can be applied with good advantage to all parts of the running mechanism. Roller bearings that support the wheels of the car frequently suffer from neglect of the owner or user of the car, and the writer has seen them ground into a shapeless mass through neglect and inattention to lubrication and adjustment.

Necessity for Proper Brake Inspection.

Automobilists who employ drivers should make insistent inquiries every week as to the condition of the brakes and should demand that they be kept in perfect condition, and owners who do not employ drivers should rigidly look after the matter themselves. By jacking up the back wheels of a car the brakes can be easily tested. The side brake lever can be put half way on the notched quadrant to find if the brake is holding the back wheels and holding them evenly. By advancing the lever notch by notch one can discover at what point the wheels are locked, and at this point the lever should still be able to move forward on the quadrant. The foot brake can be tested out in the same manner. Have the driver sit in his seat and press the foot pedal while you test the wheels. When the wheels are locked the pedal must not have been pressed down to the floor board, but must still have space underneath to allow of more forceful application.

Keep Pumps Clear of Sediment.

In the water jackets of cylinders there often remains a quantity of sand that is used in the foundry in making the castings. This sand is sometimes loosened by the circulation of the water and finds its way into the pump, when it is fitted low and close to the motor. With centrifugal pumps the effect of this sand is to wear away the pump vanes. It is, therefore, advisable to disconnect the pump in a new car at various intervals and clear it of sediment. Many rotary pumps set up end thrust, which forces the vanes up against one side of the pump, and the vanes wear down in the course of time, until the pump leaks and refuses to circulate the water. As the pump appears to rotate properly, the trouble is sometimes difficult to locate. A simple temporary remedy is to solder a strip such as a short length of wire, along each of the worn vanes, but a permanent cure can only be effected by putting in a new thrust bearing.

Preserving Tires from Rim Rust.

M. S. Fairbanks, of Fresno, Cal., writes that the very best thing that he has found to preserve tires from rim rust and consequent rotting of fabric is a German aluminum enamel paint. His mode of procedure in applying same to accomplish the best results is as follows: After thoroughly cleaning the inside of the rim with emery cloth and brushing off, the paint is applied with a brush, carefully spreading the material into the recess of the rim. Then, while this is drying, paint the bead and inner

flat space of the tire that lays on the rim. After all is dry, lay on the tape and apply tire in the usual way. It will be noticed that when occasion requires the tire to be removed, it can be done much easier, it being impervious to rust, and consequently less liable to rim cut.

Treatment of Tires After Vulcanization.

Tires that have been vulcanized during repairs ought not to be used too quickly after treatment. They should be kept in a cool, dark place for a while, away from natural deteriorating influences, so as to allow the sulphur in the rubber to freely intermingle, and so assist in reducing the rubber to its normal elastic state. Those who have vulcanized their tires have probably noticed that it takes three or four days before the new black surface assumes the grayish appearance—this exterior deposit being nothing more or less than the working out of the sulphur as a result of the heat applied during the vulcanizing process. If the tire is allowed to stand as above advised it becomes more impervious to wear, and the life of the rubber will be lengthened considerably. As the future supply of rubber is a matter of serious consideration on the part of commercial economists, the conservation of that with which we come into daily contact becomes a matter of importance.

Ran His Machine with Kerosene.

An interesting experience by a motor cyclist is told in *English Motoring*. The motorcyclist ran out of gasoline, and as there was none of that precious product to be obtained where he was at the time, he thought he would try kerosene, a quart of which he procured at a wayside cottage. There were a few drops of gasoline left in the tank, which he coaxed into the carburetor, and then poured the kerosene into the tank. The motor fired at once and he did the next ten miles without a stop. The smell was appalling and the exhaust pipe was red hot all the way, but no damage was done. The power developed appeared to be about normal.

Cranking with the Left Hand.

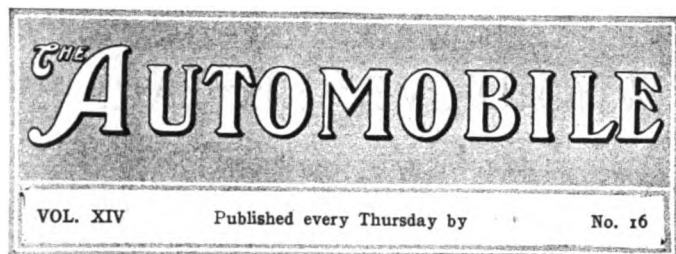
An automobilist writing to *English Motor*, makes an urgent plea to all interested to learn to turn the starting crank of the motor with the left hand. He claims that in case of a back fire the consequences are not nearly so serious to the operator's arm and wrist, and that it is much easier to get out of the way of the handle of the crank when the left hand is used. He also says that the knack of starting the motor with the left hand is easily acquired, and when once acquired the advantage gained is so great that a return to the right-hand method is not to be thought of.

The Lubrication of Steering-Gear Joints.

Lubrication of steering gears is essential to their smooth operation and longevity. Probably no other part of a car's outfit is as easy to overlook when "oiling up" as the knuckle-joints of the steering gear, yet when the continuous amount of work they perform is taken into consideration, and the strain they are subjected to is brought to mind, the necessity for proper lubrication becomes apparent. A leather cap over these joints filled with grease is the best method, as it keeps out grit, thereby reducing the wear and keeping the front wheels steady.

When the Crankcase Gets Too Hot.

When the crankcase of a motor that has been running for some time becomes uncomfortably hot, the natural inference is that there must be a leakage of burning gases past the piston. Crankcases become heated to a certain extent by conduction from the hot cylinder walls, but they should never become so hot as to be unbearable to the touch. A very hot crank chamber means that the piston rings should be looked after at once.



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**Cause and Effect in
Automobile Legislation.**

Viewed from the standpoint of the automobilist, the most liberal legislation ever accorded the automobile July 1 will be wiped off the statutes of New Jersey, and for it will be substituted the Frelinghuysen measure, shorn materially of some of its bad features through the energetic work of the Associated Automobile Clubs of New Jersey, but still containing many things detrimental to the enjoyment of automobiling in that commonwealth.

For this loss of a good law and its replacement by an irksome measure, the automobilists have only themselves to blame. True it is that a very small percentage of inconsiderate drivers are responsible for the wave of sentiment that brought about the passage of the Frelinghuysen bill, but the result is one wherein the law-abiding automobilist can find cause for serious reflection in reference to the future. It all means that the army of auto users must to some degree take upon themselves jurisdiction over these scorchers of the road and bring them to their senses in an unmistakable manner. While one might question the fairness of the means by which this Frelinghuysen bill was enacted a law, the fact still remains that it is a law and one that is going to give automobilists a deal of inconvenience. It is a heavy cost to pay for the antics of a mere handful of drivers, but all the regrets in the world will not change the situation at this particular time.

By assisting in keeping the highways free of this pernicious class of scorchers, the good automobilist may be able to lessen to an extent the enforcement of the law to its every

letter. The legislators did not dare to disregard the views of their constituents, and Governor Stokes probably shared the same apprehension. That the law will be enforced to its strictest possibility by the petty officers who will be enlisted in the work is a certainty that admits of no doubt, and it will be up to the automobilist to make the best of an unfortunate situation.



**The Pneumatic Tire:
Its Use and Abuse.**

It is a common thing to hear automobilists say that the pneumatic tire is one of the weakest points in the equipment of the automobile; in fact, it seems to be agreed that this is the case. While some parts of the machine have been so improved as to give almost no trouble, and other parts are rapidly approaching this stage, the development of the pneumatic tire does not seem to have kept pace with the general all around improvement. It is still puncturable and cut and worn by road roughness and stones. Even in the most expert hands, races are won or lost on the behavior of tires.

In the general anxiety to get a tire without weakness, many persons lose sight of the functions of the "ideal" tire. The ideal tire would consist wholly of air, the best cushioning medium we know of, and would pass over all small inequalities without jolting the car in the least. As the ideal tire is impossible, however, we must confine the air cushion in an envelope of the most resilient material available, which is rubber. And in the very fact that the rubber is resilient and soft—in its very weakness—lies the perfection of the pneumatic tire. The softer and thinner and more resilient—the weaker—the envelope can be made, the nearer it will come to performing the functions of the ideal tire. Thus it may be said that the strength of the pneumatic tire lies in its weakness.

But in the practical tire the envelope must be made strong enough to carry the weight of the car and to withstand the abrasive action of the road. Therefore some resiliency must be sacrificed to make a practical tire. It is possible to combine a certain amount of resiliency with a certain amount of strength; but it is impossible to get all there is of both.

Whether the pneumatic tire is a success or failure depends upon what is expected of it. If a man, through inability to appreciate the situation, overloads his tires, sends his car at high speeds over all kinds and conditions of roads, in all kinds of weather, neglecting tire repairs, and yet expects good results, his expectations are not likely to be realized and to him pneumatic tires will be a failure. He has not used intelligence in the matter.

If, on the other hand, he loads his tires moderately, drives with reasonable care at all times, and, especially on bad roads, gives his tires the necessary attention, anticipates, perhaps, an occasional puncture, but still expects reasonably good service, he will probably not be disappointed, and will consider pneumatics a success.

A chemist buys a fragile glass vessel because he values certain qualities it possesses; but he knows that it must be gently handled or it will break. So with pneumatic tires; they are valuable for their good features, and their weaknesses must be respected as being inseparable from their strength. It is not reasonable for a man to apply undersized, badly fitting tires to a car, drive it regardless of consequences, and then expect good service from the tires. But if he uses good tires of the proper size, well fitted and gives them the requisite attention and consideration, he will obtain such results as human ingenuity and the use of the most suitable materials known to man can produce.

Let him not forget that pneumatics can be, and frequently are, punctured; but also let him not permit a puncture in, say, the sixtieth mile of a run to wholly obliterate the effect of the other fifty-nine miles of the most delightful motion known to man. Tires, like everything else about an automobile, must be used with intelligence in order to obtain the best results; and the man who uses the most intelligence is very likely to be the man who has the highest opinion of pneumatic tires.

BAD LAW REPLACES GOOD ONE IN NEW JERSEY.

TRENTON, N. J., April 16.—The Frelinghuysen automobile bill has been signed by Governor Stokes, and on July 1 its exacting conditions will replace the liberal law secured over a year ago mainly through the efforts of James B. Dill, W. E. Scarritt, W. F. Sadler, Jr., and other enthusiastic Jersey automobilists. The associated automobile clubs of New Jersey made a determined and partially successful effort that curbed, to some extent, the Frelinghuysen measure, though enough remains to make trouble for automobilists, and it will take away much of the pleasure of automobiling in this state.

The replacing of the so-called Dill law by its drastic successor unquestionably was brought about by the reckless scurrying across the state of unthinking and heedless New Yorkers and Philadelphians. That the law will be rigidly enforced in every particular in some parts of the state where the previous reasonable law was sadly abused is a certainty, and this will mean that many miles of excellent highway will be practically impossible except at a funeral pace.

The main points of the new law are herewith briefly outlined:

REGISTRATION.—The Frelinghuysen bill, as passed in its amended form, makes the Assistant Secretary of State the ex-officio Commissioner of Motor Vehicles, and places in his charge and supervision the enforcement of the provisions of the law. An Inspector of Motor Vehicles is to be appointed by the Secretary of State and provided with the necessary assistants. The Commissioner is authorized to designate the chief of police and his deputy of any municipality of the state, or any other proper person, to act as agent for the Commissioner for the registration of automobiles and issuance of certificates, the examination of applicants for driving licenses, and the granting of licenses.

FEE.—The registration fee for automobiles of less than 30 horsepower is fixed at \$3 a year, and for those of more than 30 horsepower, at \$5 a year. When the power is stated in hyphenated figures the greater figure is to be the basis of the fee. Upon the sale of a car to a second owner the registration certificate may be renewed upon payment of \$1. The fee for registration of motorcycles is \$1.

Manufacturers' and dealers' certificates, good for five cars, can be obtained upon payment of a fee of \$20, but the letter M must be displayed on the number tags affixed to the cars.

DRIVING LICENSES.—Driving licenses may be issued by the Commissioner, "at his discretion," to proper persons, sixteen years of age or more, after examination as to his knowledge of the machine and his ability to operate it safely, upon payment of a fee of \$1 for cars of less than 30 horsepower and of \$2 for cars of 30 horsepower or more. Permits to drive while learning to operate, when accompanied by a licensed operator, may also be issued to cover a period of three weeks. All drivers, however, are held liable for any damage they may do. Driving licenses may be refused at discretion to improper persons, and registration also may be refused to any machine that the Commissioner thinks is not a proper vehicle to be operated on the public highways.

REVOCATION OF CERTIFICATES.—To the Commissioner of Motor Vehicles is also given the arbitrary power of revoking registration certificates and driving licenses for a violation of the law, and no new license that may be issued to the same car or driver within a year shall be valid unless granted by the Commissioner in person.

REGISTRATION NUMBERS.—Registration numbers must be displayed at front and rear of the car, not less than fifteen inches nor more than thirty-six inches from the ground, and must be kept clean. The figures must be in Arabic numerals, not less than four inches high. It is prohibited to display any other number on the front or rear of the car, and registration tags of other states will not be recognized.

SPEED.—Speed is restricted to a maximum of a mile in three minutes (twenty miles an hour) in the open country, a mile in

four minutes within 200 feet of any horse or "other beast of draught or burden," except that any necessary speed up to twenty miles an hour may be lawful in passing a vehicle going in the same direction. The same four-minute limit applies at crossings in the open country, while speed at crossings in built-up places is restricted to a mile in five minutes. On sharp curves and at corners the rate must not exceed a mile in seven minutes. Upon signal from a person driving a horse by uplifting the hand, the automobilist must stop to let the horseman pass. All persons must drive with reasonable caution with regard to traffic at all times. Doctors and military authorities, however, are exempted from the foregoing speed restrictions. Should a driver cause an accident or injure any person he must stop at once and return to the scene of accident, and, if requested, give the names and addresses of all occupants of the car and registration and license numbers. Driving for a wager or bet is prohibited.

ARRESTS.—Arrests for violation of the law may be made without warrant, or upon warrants sworn out within thirty days of the commission of the act. More than half the text of the law pertains to proceedings in prosecution. Upon arrest, the automobile may be accepted as bail.

PENALTIES.—The penalty for failure properly to display the registration tags, and no other, is a fine of not less than \$20 nor more than \$100, and for a second offense the fine may be doubled. For displaying a fictitious number the penalty may be either a fine of from \$25 to \$500, or imprisonment for not exceeding sixty days, in the discretion of the court. Failure to return after an accident and give names will make the driver of a car liable to a fine of from \$25 to \$100, or to imprisonment for not more than thirty days.

Violation of the speed provisions will render a driver liable to a fine of \$25 to \$100 for the first offense, and double the fine or imprisonment for not more than thirty days, and, in addition, the revocation of his license.

GENERAL FEATURES.—Other clauses of the law prohibit the use of tire chains except when one inch or more of snow or ice covers the surface of the road, require two brakes on cars of more than 10 horsepower, a signal trumpet, two white lights in front and one red light in the rear, and the number of the registration certificate painted on the lamp glass in figures one inch high.

All money collected for licenses is to be used for road improvement, except that \$3,000 may be expended for the erection of guide posts and warning signs.

ALCOHOL BILL GOES TO SENATE.

WASHINGTON, D. C., April 16.—By a vote of 224 to 7 the National House of Representatives to-day passed the Free Alcohol bill. Mr. Payne, of New York, explained the provisions of the measure, stating that it provides that denatured domestic alcohol may be withdrawn from bond without the payment of an internal revenue tax for use not only in the arts and industries, but for fuel, light and power. The bill provides for its denaturing—that is, making it poisonous so that it cannot be used as a beverage or medicinal purposes.

ANOTHER RISE IN GASOLINE PRICES.

CLEVELAND, O., April 16.—To-day announcement was made by the Standard Oil Company of a further advance in the price of gasoline and refined oil of one-half cent per gallon. The new quotations which take immediate effect are: Ohio state test refined oil, 9 1-2 cents; water white Ohio state test, 10 1-2 cents; varnish-makers and painters' naphtha, 12 1-2 cents; deodorized stove gasoline, 13 1-2 cents; 74 to 76 degree gasoline, 16 1-2 cents; 80 degree gasoline, 19 1-2 cents; 87 degree gasoline, 20 cents; 88 degree gasoline, 21 cents.

L'HOMMEDIU BILL TANGLE.

ALBANY, N. Y., April 17.—President O. A. Quayle, of the New York State Automobile Association, and Secretary S. M. Butler, of the Automobile Club of America, last night had an interview with Senator L'Hommedieu and Speaker Wadsworth, the result of which was a thorough understanding concerning the L'Hommedieu bill, which passed the Senate Thursday last and reached the Assembly Friday in a bungled and unsatisfactory condition.

The bill in the first place as it passed the Senate was not amended by the senator from Orleans county to suit the automobilists, for the senator did not bother to put in the suggestions furnished by them. It was said at the hearing a couple of weeks ago that the direct tax imposed on a special class of vehicles which did no injury to highways, but rather benefited them, was unconstitutional. The highways are public and it is neither equitable nor just taxation to tax a motor vehicle and let a narrow-tired wagon go untaxed, and the Constitution requires that taxes shall be laid in an equitable and just manner. The auto owners were willing to be taxed if the fund raised thereby could be devoted to maintaining good roads, and so expressed themselves.

L'Hommedieu Was Forgetful.

It was proposed to have the L'Hommedieu bill redrawn so as to increase the registration fee now required for the registration of motor vehicles under the existing law. It was understood that Senator L'Hommedieu consented to this. A redraft was presented to him to take as a model or to incorporate bodily. He did neither and merely added a word or two to his old bill and rushed it through the Senate about the time the auto men discovered the scheme.

Meanwhile the general laws committee had blundered into an idiotic move which was both unnecessary and unwise. It reported as a substitute to the bill of A. E. Lee, which had been recommended to it for embalming, the L'Hommedieu auto-tax bill. There was no relevancy in the substitution. They were merely two bills amending different sections of the motor-vehicle law for entirely different purposes.

The L'Hommedieu bill was handed down to the Assembly Friday as a Senate message by Speaker Wadsworth, who started to refer it to the committee on taxation. He was interrupted by Mr. Draper, of Niagara, who moved to substitute it for the copy of the same bill which the general laws committee had substituted for the A. E. Lee bill regarding the stopping of autos when horses are encountered. A question arose among the members as to whether the two copies of the same bill were identical. A motion to send the two to the revision committee for comparison was made but never put by the Speaker. It was suggested that the substitution of the Senate bill for the regularly reported substitute might jeopardize it. The whole question was let in the air without action by the House or the Speaker and the next bill was taken up.

Now Will Contain Two New Ideas.

At the conference last night it was arranged that the L'Hommedieu bill would be amended by the Assembly Taxation Committee in accordance with the desires of the automobilists so as to provide for a registration fee instead of a tax. The amendments drawn up by Charles T. Terry after the hearing of a fortnight ago before the Senate Committee, and which were to have been included in the measure as it passed the Senate, will be incorporated in the Assembly bill, and also two additional features of some moment.

These new features are embodied in provisions for a reciprocal license or registration clause, whereby New York State shall not recognize the badges and licenses of any state which does not recognize the licenses and badges from this state. This will hit New Jersey first and foremost.

The other is a clause making it a misdemeanor for a chauffeur to take out an automobile without the consent of its owner, punishable by a fine of \$100 or imprisonment, or both.

President Quayle has an appointment to meet Chairman Wade, of the Assembly Tax Committee, to-day, and will present the redraft of the L'Hommedieu auto tax bill which is desired as an amendment or substitute for that which the senator passed after he had agreed to amend it. It is expected that the committee will report the bill thus redrawn at its next meeting, to-day or to-morrow, so that it may be speedily passed through the Assembly and returned to the Senate for concurrence.

Gardiner Insurance Bill Impossible.

The Gardiner bill to permit automobiles to be insured anywhere they may be on a sort of Lloyds marine insurance plan will not get out of the Senate Insurance Committee, as it is so drawn as to mix up the fire insurance law and cover much more than automobiles.

FEATURES OF OHIO'S NEW LAW.

COLUMBUS, O., April 16.—Mayor Badger, of this city, has issued orders to the police department to enforce the city ordinances and statutes of Ohio regulating the speed of automobiles. He proposes to stop dangerous driving. In this position he has the support of the Columbus Automobile Club, which at all times has opposed reckless driving of machines, and whose every move has been for the welfare of automobilism.

The discovery has been made that the \$100,000 which the Sawicki automobile law will yield this year and next cannot be used for road improvement purposes as intended, until an act is passed specially appropriating the money for the purpose. The law says that this revenue shall be used for the betterment of the roads, but an enabling act is necessary to get the money out of the treasury. This the legislature overlooked, but the mistake was somewhat excusable, as the bill was not passed until the last hours of the session. Because of this the money will be tied up in the treasury until the next meeting of the legislature, a year from next January.

Though the law does not become effective until June 1, Secretary of State L. C. Laylin, who is charged with its enforcement, is being deluged with applications for licenses by owners and drivers. He is now preparing the necessary blanks on which applications will be made. General satisfaction is being expressed over the law by autoists, who believe it will promote the sport.

OFFICIAL REPORT FAVORS FREE ALCOHOL.

George E. Murray, inspector of combustibles of the Fire Department of New York City, after a ten days' investigation of the causes of the sewer explosions on Ninth avenue, has made a report to the fire commissioners in which he recommends that "the authorities unite to remove gasoline from use as a motive power in vehicles by removing the tax from alcohol, which, mixed freely with water, renders explosions impossible."

The report of the inspector explicitly states that he does not believe that waste gasoline from fifty or more garages, which are connected with the sewer, had anything to do with the sewer trouble. He thinks that the explosions were caused by gases accumulating from substances containing sulphureted hydrogen, light carbureted hydrogen and carbonic acid.

In his investigation Mr. Murray states that he found that the owners of automobile garages are too careful of gasoline to let it go to waste in a sewer. He found that in all garages the utmost vigilance was exercised to enforce economy in the use of gasoline. He recommends that each garage be obliged to build a cesspool to receive refuse grease, oil and used kerosene.

To prevent repetition of explosions in the sewers Mr. Murray would have all sewers flushed with gas-dispelling preparations and a gasoscope used to give automatic warning when gases have accumulated.

NEW YORK'S OPEN-AIR SHOW.

Plans are now being rapidly perfected for the open-air automobile show and carnival which will be held at the Empire City track May 24, 25, and 26, under the auspices of the New York Automobile Trade Association. The space under the grandstand, about 7,000 square feet, will be allotted to the accessories. Automobiles will be exhibited in two large tents in the infield, the largest of which will measure 110x205 square feet, giving 22,500 square feet of floor space. The second tent will supply 14,000 square feet. The price for space will be thirty cents a square foot, and the Trade Association will supply uniform signs, settees, or chairs in the space, the watchmen, and keep the exhibits in shape. The price for space under the grandstand to the accessory people will be twenty-five cents a square foot. All applications for space must be in the hands of the committee by Tuesday, May 8, and the allotments will be made by drawing on Thursday, May 10. Any profits will be divided, one-half to the treasury of the association, and one-half rebated to exhibitors who are members.

Arrangements are being made for a formal opening on Wednesday afternoon, May 24, with public officials and prominent automobilists in attendance. Thereafter the show will be open daily from 10 A. M. to 6 P. M. The carnival committee consists of William M. Haradon, chairman; Frank Eveland, and C. Andrade, with C. R. Mabley, president. Space diagrams and further particulars can be obtained by addressing Alfred Reeves, manager, 29 West Forty-second street, New York.

Massachusetts State A. A. Election.

Boston, April 16.—At the annual meeting of the Massachusetts State Automobile Association the following officers were elected: President, Elliot C. Lee; vice-president, Franklin Weston; secretary-treasurer, John C. Kerrison; legislative committee, Lewis R. Speare, chairman; good roads committee, John P. Coughlin, chairman; membership committee, W. H. Chase, chairman.

It was the opinion of those present at the meeting that the work for good roads should be continued, and that when the legislature passes the signboard bill of the association, it should at once begin the erection of the signboards, especially on the much traveled roads. The legislative committee was much praised for its efforts toward securing more liberal laws.

Erection of Signboards to Begin.

Within the next few weeks nearly 200 signboards will be placed along the roads chiefly frequented by automobile tourists between New York and Boston and New York and Philadelphia. The work of placing these boards is being done by the Automobile Club of America, in co-operation with the American Automobile Association, the first-named organization having appropriated \$2,000 for the purpose. Between New York and Philadelphia 60 signs will be used, and on the Boston route fully 150 will be placed. The work will be completed by June 1.

Ormond-Daytona Beach Railroad.

Permission has been asked of the Board of County Commissioners at DeLand, Florida, by C. S. Reiman, of Daytona, to lay railroad tracks between Daytona and DeLand. It is proposed to start the new line at Ormond, touch at Seabreeze, the clubhouse of the Florida East Coast Automobile Association, Daytona Beach, and continue to DeLand and Beresford Landing. If permission is granted for construction of the road gasoline passenger cars will be operated on it, affording frequent and direct transportation between Ormond and Daytona at next winter's Florida beach automobile tournament.

READVILLE RACES ON MAY 30.

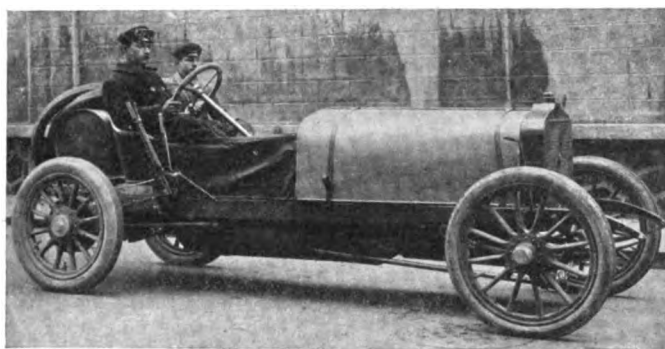
Boston, April 16.—Six events have been announced for the Readville track races on Memorial Day, May 30, by the race committee of the Bay State Automobile Association. There will also be several match races to be arranged later. The events already arranged are the ten-mile free-for-all, five-mile race for amateur owners and drivers, five-mile race for gasoline cars listed at \$1,000 and less, five miles for gasoline cars listed between \$1,000 and \$2,000, five miles for cars listed between \$2,000 and \$3,500, and a five-mile race for cars costing above \$3,500.

The committee has received assurances from a number of persons who own fast cars that they will enter them in the Readville races, and it may be that some of the prospective Vanderbilt Cup racers will be seen in Boston. The track has been secured and the committee is making plans for handling a record crowd.

Late Grand Prix News.

PARIS, April 10.—The first 1906 car to be tested on the Sarthe Circuit was the six-cylinder Bayard-Clement to be driven by Villemain. During the trials the car, which has a transmission by cardan, reached a speed of 96 3/4 miles an hour on the level.

Baras, on one of the Brasier cars, built specially for the race, ran round the course three times in succession the other day at high speed. The Trefle à Quatre driver declares the circuit ad-



CLEMENT-BAYARD RACER—VILLEMAIN AT WHEEL.

mirable and predicts an average speed of from 70 to 75 miles an hour for the winner of the race. Edmond, on his 1906 Renault, is also running trial trips on the circuit, and Gabriel of the De Dietrich team is expected this week.

Oldfield Among the Texans.

HOUSTON, TEXAS, April 16.—Three thousand people attended the automobile meet at the Houston Driving Park, on April 11, and saw Barney Oldfield send his Peerless *Green Dragon* against his mile record of 1:13 on a half-mile track. He negotiated the distance in 1:19.4-5, which was the fastest time Houston automobilists had ever seen, and they were enthusiastic. The three-mile match race, best two in three, between Oldfield and Paul Albert, was, of course, won by the former in two straight heats. In the local events S. Bering won the 3 1/2 mile in a Cadillac in 5:28, and John Foley won the two-mile novelty race. The two-mile handicap was won by Oldfield from scratch.

A. A. A. Will Recognize F. A. M. Suspensions.

In response to overtures made by the Federation of American Motorcyclists, the American Automobile Association has agreed that henceforth suspensions made by either organization will be respected and enforced by the other, which means that an automobilist punished by the American Automobile Association will not be permitted to compete as a motorcyclist nor drive a car at a motorcycle meeting, the same being true of the suspended motorcyclist who might seek refuge in the automobile ranks or attempt to ride in a motorcycle race at a "mixed" meeting.



**BAKER RUNABOUT THAT IS TRYING FOR MILEAGE RECORD.
A LIKELY MILEAGE WINNER.**

CLEVELAND, April 16.—Unless some of the club members get a remarkable hustle on, the Cleveland Automobile Club's mileage trophy, for the first quarter of the year at least, is likely to be won by a little colored man who drives an electric machine. He is not a member of the Cleveland Automobile Club, but Walter Baker, for whom he drives, is a member.

Last year the club cup was carried off by a driver who covered only about 7,000 miles. Mr. Baker, while not much of a mileage fiend himself, decided that he would like to have the trophy won this year with a Baker electric. He bethought himself of the little delivery runabout which carries small supplies to and from the factory and takes care of repair jobs for the several hundred electric vehicles about Cleveland and vicinity. The little wagon is on the go practically all the time and will beat 7,000 miles by 100 per cent. or more, according to Mr. Baker.

LATEST AUTOMOBILE STAIR-CLIMBING FEAT.

The latest stair-climbing trick with an automobile was performed in San Francisco recently when George B. Woodward drove a 16-horsepower Reo touring car up a double flight of stone steps into Alamo Square and then drove down again. There are forty steps in the double flight and they form a grade estimated at 35 per cent. There is a level landing halfway up. The car ascended the first flight steadily and without a halt, then came to rest on the landing. Having gained confidence, Mr. Woodward started again and went up the second flight, then turned around and came down "head first," without stopping the engine. An interested crowd watched the performance.



16-H.P. REO CLIMBING STAIRS AT SAN FRANCISCO

GASOLINE TANK THAT STOOD THE TEST.

On the afternoon of March 23, fire broke out in the engine room of the Schaeffel Garage, in Rochester, N. Y., and rapidly spread through the entire building, which is used in part as a furniture warehouse, and as a livery stable in the south portion. In one part of the building several barrels of gasoline were piled up on the floor. These soon caught fire and added fuel to the flames. Where the fire was hottest, in the midst of the burning debris, were located a Bowser gasoline pump and a three-compartment lubricating oil cabinet. The gasoline was stored in an underground tank in the yard.



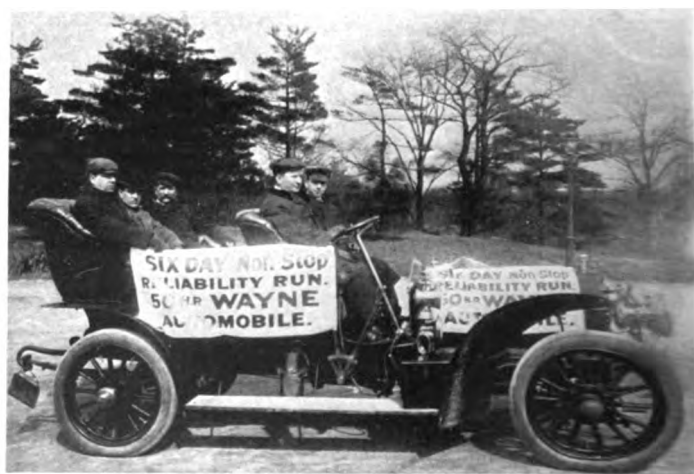
RUINS OF SCHAEFFEL GARAGE WITH UNINJURED TANK.

After the fire it was found that the entire equipment was in working order.

ACCIDENT STOPS WAYNE RUN.

An unfortunate accident on Thursday afternoon, April 12, about 3 o'clock, brought the New York non-stop run of the 50-horsepower Wayne to a sudden termination. Branch Manager A. L. Kull, however, has every reason to feel proud of the achievement of his car, as it reeled off 1,261 miles in 87 hours without a skip, which is said to be a new non-stop record.

The sudden termination of the run was in no way due to the car or its motor, but to a collision when the machine got into a jam of vehicles at Fifty-eighth street and Broadway and a



50-H.P. WAYNE—87 HOURS NON-STOP—1,261 MILES.

horse-drawn cab backed into the car and punched a five-inch hole into the radiator. Driver Rockford, who was in the car at the time, brought it back to the Wayne salesroom, without stopping the motor, but as the water was pouring out of the radiator it was only a question of time before the engine would heat up, and Mr. Kull regretfully gave the order to shut off power.

PHILADELPHIA TRADE.

PHILADELPHIA, April 16.—Quite a sensation was sprung along Automobile Row last week when it was announced that the Motor Shop, which handles the Royal Tourist, had taken over the local agency for the Oldsmobile. The Olds has so long been represented here by the Quaker City Automobile Company that the two had become almost synonymous. To make room for the additional space required Manager Gantert had a large force of men at work all last week making the necessary alterations in the repair plant and storage rooms.

This question of storage room in establishments along the "Row" is becoming a burning one. Very few concerns, even the largest, have any more space than they need, and as each new customer almost invariably wants to keep his car at the place where he buys it—indeed, insists upon such an arrangement as one of the terms of purchase—the condition of affairs is becoming interesting, to say the least. It is manifestly impossible just now, right in the heart of the season, to embark on any comprehensive scheme of rebuilding or alteration; yet not a few of the "Row" managers have been compelled to call in carpenters and make what temporary changes they can in order to take care of their patrons. Next fall and winter is likely to witness such a tearing out and rebuilding all along North Broad street as will cause the public's eyes to open, for managers and agents cannot afford to again be caught unprepared in this respect.

Complaints of the constant use of the smooth asphalt streets in the neighborhood of the several automobile schools by the inexperienced pupils of those institutions of learning—and to the detriment of the smaller children at play or going to or from school—are becoming frequent. These concerns are well within their rights, it appears, and, having paid for licenses and tags, are entitled to the use of the highways, when and where they please, so long as they keep within the legal limits of speed and obey the other regulations. Yet there is something to be said for the citizens whose children have been wont to play and skate on the streets, but who are now driven to the sidewalks by the constant procession of cars handled by future Tracys, Hemerys and Demogeots. The managements of all these concerns are making every effort to prevent accidents, and yet the complaints continue. The National Automobile School Company, at Oxford and Carlisle streets, for instance, has upward of 150 pupils enrolled, many of them women, and although in the early stages of their instruction they are accompanied by an expert, the advanced pupils are often allowed to go out alone, and these are the ones that usually cause the trouble—taking all sorts of chances and keeping the "honk! honk!" working overtime.

The local Locomobile branch house has just lost a good man in "Mile-a-Minute Phil" Williams, who has gone to Chester, Pa., to manage the Chester Automobile Company, which has just opened its quarters at Broad and Crosby streets. Besides doing a general repair and storage business the concern will handle the Cadillac car in Chester and near-by Delaware county.

The latest claimant for the favor of the Quaker City automobile contingent is the Pullman car, built by the York (Pa.) Motor Car Company, and which will be handled here by the Tioga Automobile Company, of Broad and Tioga streets. This concern also represents the National line in Philadelphia and adjacent territory.

A. J. Picard, manager of the local Rainier branch, selected Easter Monday for the official opening of the just completed quarters at 236 North Broad street. A large crowd of visitors inspected the new plant and the cars.

Manager Hoffman, of the Ford branch house at Broad and Buttonwood streets, will be assisted during the present season by Louis C. Block, one of the traveling representatives of the Ford Company.

Foss & Hughes, who represent the Pierce-Arrow, Cadillac and Baker electric cars in Philadelphia, have secured J. H. Fassett, a prominent local electric vehicle expert, to take charge of the Baker end of the outfit.

BOSTON SHOW WIND-UP.

BOSTON, April 16.—That famous organization, the Boston Show Company, has been dissolved by vote of the stockholders, taken at a meeting last week. It is safe to say that for the past two or three years nothing has caused so much discord among the Boston automobile dealers, or between the dealers and the manufacturers, as this same Boston Show Company. Formed a couple of years or more ago, when discord was rife among the dealers over the results of the first profitable Boston show, the show company clinched matters by securing a lease of Mechanics Building for automobile show purposes. This was the only building in Boston capable of housing the automobile show, so that the show company, whose members, by the way, were leading members of the Dealers' Association which ran the show, was able to dictate such terms as it wished to the Dealers' Association. The fact that certain dealers were drawing from the show profits as stockholders of the show company, members of the Dealers' Association and exhibitors, naturally caused some hard feeling.

As a result, when the show of 1905 was proposed, the manufacturers took a hand, and all sorts of things were threatened, including the withholding of a sanction, if some more equitable arrangement was not made for a division of the show profits. This agitation resulted in the admission to the show company of a considerable number of dealers, thereby greatly enlarging the show company. The company, however, still continued to hold the lease, and got a good share of the profits. But after the show was over the manufacturers looked to their branch managers who were in the company for their share of the show company's profits. The managers were not anxious to give up, and they did not until things were made so warm for them that they had to give up their profits to keep their places. This year the show company still had the lease, but it was decided that as all its members could not get a share of the profits it was no use keeping together. There was no friction over the 1906 show, though the lease had to be secured from the company.

Another thing which led to the dissolving of the company was the fact that many of its stockholders had ceased to be identified with the trade as agents or managers, but were drawing dividends just the same.

A Boston Trade Change.

BOSTON, April 16.—An important shift in local trade circles was consummated last week. This time, however, the disturbance is not among the branch managers, as has been the case in most of the recent shakeups, but among the agents. It consists of the merging with the Harry Fosdick Company, of the Robbins Brothers, of the Motor Mart, the representatives of the Waltham-Orient line. The Harry Fosdick Company was formed about a year ago with Harry Fosdick, formerly the Winton branch manager, and J. A. Dowling, formerly of Dowling & Maguire, agents for the Pierce, as the officers, with a capitalization of \$15,000. By the new arrangement Mr. Dowling retires from active connection with the firm, and will devote the larger part of his time to his Pierce agency in the northern New England States, with headquarters at Portland, Me. He will also be the Maine representative of the Harry Fosdick Company. With the retirement of Mr. Dowling, Harry Fosdick becomes president of the Harry Fosdick Company; Lincoln D. Robbins, treasurer, and Alfred N. Robbins, secretary.

The company will retain its present garage and office on Stanhope street, where Harry Fosdick will be general manager, but it will also have a retail branch in the Motor Mart in Park square, in the large salesroom beside the main entrance. This department will be in charge of Alfred N. Robbins, Lincoln D. Robbins becoming the mechanical expert. The company's capitalization has also been increased to \$25,000. At the present time the Harry Fosdick Company controls the agency for the Fiat, Studebaker line, Lozier, and Waltham-Orient line, and it is said that it will take on other agencies in the near future.

RACING RESULTS AT MONACO.

Advices by cable from Monaco state that critics received a rude shock by the victory of *Le Delahaye* in the 18-meter class Tuesday, April 10. She has a 400-horsepower Delahaye motor, and it had been claimed by experts that a big, slowly rotating motor had no practical future. She led from the start and beat out the *Le Dubonnet*, *Mercedes D. C.* and *Mercedes W. N.*, the last-named boat not finishing. The time was 1:18:04. In the 12-meter class, on the same day, the *Calypso*, 40-horsepower Mors motor, won in 1:28:28 from the *Delahaye-Nautilus* and *Excelsior*. The distance for both races was 50 kilometers.

The most important race of the Monaco meeting was run on Thursday, April 12. It is known as the championship of the sea and the distance 200 kilometers, about 125 miles. *Le Delahaye* again won in 4:20:12 from a field of 25 starters, with *Antoinette IV* second, *Fiat XIII* third, and *Yarrow-Napier* fourth. The *Fiat XIII* led almost from the start up to 180 kilometers.

The handicap events were run on Friday, April 13, and the work of the handicapping officials is reported to have been excellent. In the racers' event the *Yarrow-Napier* won, beating the *Seasick* by five seconds. Fournier handled the wheel of the *Seasick*, whose motor was of Itala make. The *Yarrow-Napier* had one minute handicap, which was just enough to enable her to win, though at times the *Seasick* was almost on even terms with her. Fournier was disappointed at not winning the race, but was consoled by the fact that he had beaten the record for fifty kilometers, his time being 1:04:08. The *Mercedes D. L.* was third, the *Mercedes W. N.* fourth and the *Volauvent* fifth. The cruisers' contest was won by the *Florentia IV*, with the *Calypso* second.

ATLANTIC CITY TOURNAMENT.

What should be the greatest straightaway race meet ever held in the North will take place at Atlantic City, N. J., April 25, 26 and 27, under the auspices of the Atlantic City Automobile Club. A grandstand capable of seating 8,000 people has been completed, the street railroad has made adequate arrangements, and the entire course will be roped off in such manner as to make accident impossible. In addition an army of policemen will be employed in guarding the course.

Such notable cars as the 80-horsepower Darracq which won the Vanderbilt Cup race and later the Havana Cup, the Thomas six-cylinder racer, the Grout steamer and the Mount Washington Napier are included in the high-speed events. Following is a list of the principal entries:

A. L. Kull, 40-h.p. Wayne; A. E. Schwartz, 50-h.p. Wayne; Edwin H. Cutherd, 8-h.p. Reo; Harry Haynes, 30-h.p. Grout steamer; Frank S. Walton, 30-h.p. Stoddard-Dayton; Montague Roberts, 50-h.p. Thomas; H. N. Harding, 30-35-h.p. Daimler; Al. Poole, 30-h.p. S. & M. Simplex; C. M. Hamilton, 30-h.p. S. & M. Simplex; Jonathan N. Wilkins, Jr., 40-h.p. Winton; Charles J. Swain, 40-h.p. Winton; R. B. Craufurd, 50-h.p. Stevens-Duryea; Mrs. Joan Newton Cuneo, 10-h.p. Maxwell and 18-h.p. White; H. Ernest Rogers, 20-h.p. Stanley; W. C. Mullen, 50-h.p. Thomas; William Wallace, Jr., 80-h.p. Darracq; G. H. MacWilliam, 80-h.p. Darracq; Walter E. Edge, 20-32-h.p. Darracq; P. F. Rockett, 30-h.p. Stoddard-Dayton; William H. Hilliard, 80-h.p. Napier; James E. Bristol, 40-45-h.p. Pierce; Joseph D. Swoyer, 35-h.p. Daimler; Harry Kerr, 24-h.p. Packard, and the Reo Bird.

\$5,000,000 FOR GOOD ROADS.

ALBANY, April 16.—As a result of several conferences of the good roads advocates of this state, the legislature will appropriate \$5,000,000 this year for good roads under the \$50,000,000 bond issue for this purpose approved by the people last fall. This is viewed with considerable favor by the good roads advocates, as they had not asked for a definite sum and the liberality is appreciated. The West bill provides that the money shall be apportioned according to the population and the use of roads.

VANDERBILT CUP ENTRIES.

Entries for the Vanderbilt Cup race, to be run on October 6 next, mainly over the same course on Long Island that was used last year, are already being received by the Cup Commission, although the entry blanks have not yet been printed. The first entry was made by Col. A. A. Pope as last year, the car being a Pope-Toledo, which was entered through the Automobile Club of America. No particulars have been given regarding the car, but it is generally believed to have six cylinders that will develop 90 horsepower. The entry was accompanied by a check for \$1,000 to cover the fee decided upon at the last meeting of the Commission.

The second entry was made by Messrs. Breese, Moulton and Lawrence, three young men of socially prominent and wealthy families of Long Island, who have nominated a four-cylinder car of their own design and construction, which is said to be of 80 horsepower. The name *Pirate* has been given to the machine, which was exhibited in the Automobile Club of America show in New York last January.

Almost simultaneously with the preceding entry was received the entry of a regular model 60-65-horsepower Matheson touring car by the Matheson Motor Car Company of New York.

Announcement has also been made by the Olds Motor Works that it will build a six-cylinder racer to compete for the cup. President F. L. Smith, of the company, when in New York a few days ago, said that he had every confidence in the ability of Howard Coffin, chief engineer of the Olds factory, to turn out a creditable racer, and that every mechanical and financial facility would be given him. Ernest Keeler, who will probably be nominated to drive the car in the race, has made several trips in an Olds 28-30-horsepower, four-cylinder car over the roads of Long Island over which it is thought the race may be run, and, from observations made, he thinks some phenomenal times will be made in the elimination race.

GEN. GRANT DID NOT RIDE.

WILMINGTON, DEL., April 16.—It was expected that Wilmington would have its first real automobile demonstration last Monday, on the occasion of a visit from Gen. Frederick D. Grant, of New York, who came here to present to the Fourth Delaware Regiment Association, on behalf of the National Flag Association, a handsome American flag, but, unfortunately, rain fell in torrents nearly all day and the plans of the committee had to be changed so as to cut out the automobile features to have been conducted by the Wilmington Country Club.

The Wilmington authorities are making war on outsiders who come here and violate the automobile law. A few days ago a Philadelphia banker was here in his auto and a policeman said he was riding too fast, as a result of which he was fined \$40, although it was stated, on behalf of the banker, that he did not appear to some people to be exceeding the speed limit.

THE ENGLISH 4,000-MILE TRIAL.

March 31 witnessed the close of the 4,000-mile tire, lamp, and speedometer trials, arranged by the Automobile Club of Great Britain and Ireland, and run on the roads around London during the month of March, the running time being 25 days in all. A brief official summary of the results follows: Twenty-horsepower Dennis, non-stop throughout except on first day, when gasoline filter choked up at 85½ miles; Collier tires, 36-inch and 34-inch, non-stop on 22 days, 815 mm. non-stop on 23 days; tail lamps, Ryta & Houet, went out only five times during entire run; Worsnop headlights, burned well, but unfortunately suffered from pipe obstruction. The speedometers were tested over 2,000 miles, one lot running the first and the remainder the second half of the trials. The Elliott, Jones, Gratze, and Cowey made non-stop records throughout.

OMAHA'S FIRST SHOW.

OMAHA, April 14.—Omaha's first automobile show which was held April 4 to 7 was a marked success. It attracted a great deal of attention in this part of the West, more than 10,000 persons visiting the Auditorium, where it was held. This is the largest building of its kind in the city but the interior was filled and made attractive by the display of several hundred thousand dollars' worth of cars, appropriate pictures and decorations. There was orchestra music and moving pictures reproduced scenes in famous automobile races.

The local dealers were well pleased with the results. During the show they sold more than \$40,000 worth of vehicles and entered into negotiations for many additional sales. Interest in the show seemed to develop spontaneously. Agents say the show firmly established Omaha as a distributing center for automobiles and supplies and created an interest that will make the city one of the best automobile towns in the West.

Eastern manufacturers pleased the local people a great deal by spending considerable money in sending high-grade cars here and experts to discourse regarding them to the visitors.

The Omaha Automobile Dealers' Association was organized for the primary purpose of holding the show, with the following officers and members: Clark G. Powell, president; H. E. Fredrickson, treasurer; Frank W. Bacon, R. R. Kimball, J. Clarke Coit, T. M. Bromwell, J. J. Deright, J. M. Gillan and R. C. Doziera.

Exhibits were made by the Powell-Bacon Company, showing the Baker electrics, White steamer, Pope-Toledo, Cadillac and the Franklin; H. E. Fredrickson, showing the Thomas, Peerless, Haynes, Buick and Woods electric; R. R. Kimball, exhibiting the Stanley steamer, Stevens-Duryea and Columbia electric; the Rambler Automobile Company, showing a complete line of Ramblers, and the Deright Automobile Company, with the Stoddard-Dayton, Reo, Maxwell and Waverley electric cars.

One of the novelties of the show was a gasoline truck manufactured by the Karbach Automobile and Vehicle Company, of Omaha, and the first output by this firm.

The Reo company exhibited its Baby Reo, and a Hayries model of 1889, said to be the first automobile to appear on Omaha streets, was shown by H. E. Fredrickson.

The fact that every car shown in the Rambler exhibit was sold indicates the business done at the show. One of the sales made was to L. W. Monk, of Orleans, Neb., who will try the automobile in stage line work between Orleans and Phillipsburg, Neb. A Cadillac car was bought by Reed Bros., of Omaha, for use in their real estate business. A great many of the sales were to residents of smaller cities and towns throughout Nebraska and Iowa, but a fair proportion is accredited to Omaha.

ELECTION OF T. P. A. OFFICERS.

At the recent second annual meeting and banquet of the Technical Publicity Association, held at the Aldine Association, New York, the following officers were elected: President, F. H. Gale, of the General Electric Company; first vice-president, H. M. Cleaver, of the Niles-Bement-Pond Company; second vice-president, C. B. Morse, Ingersoll-Rand Company; secretary, Rodman Gilder, Crocker-Wheeler Company; treasurer, H. M. Davis, Sprague Electric Company; members of the Executive Committee, Robt. L. Winkley, Pope Mfg. Company and G. M. Basford, American Locomotive Works; members Election Committee, C. W. Beaver, Yale & Towne Mfg. Company; Chas. N. Manfred, H. W. Johns-Manville Company and H. H. Kress, A. S. Cameron Steam Pump Works.

P. F. Kobbe, former president of the Association and now an advertising specialist, was the guest of the evening and gave an address on the general subject of advertising. An informal discussion followed in which members and guests took part.

The membership of the Association shows a steady increase, and its finances are in good condition. The following resolution was unanimously passed: **RESOLVED**, That the Association shall take active steps to secure definite information regarding the circulation of mediums in which the members of the Association are interested.

A MARYLAND ASSOCIATION.

BALTIMORE, April 16.—The Maryland Motor Exhibition Association was formed in this city last week with the following officers: President and general manager, B. R. Johnson; vice-president, Howard W. Gill; treasurer, A. S. Zell; secretary, E. L. Buchanan. The fifth incorporator was R. J. Atkinson, and these five also compose the board of directors.

Mr. Johnson was general manager of the automobile show which closed here on April 7. Mr. Gill is a member of the Motor Car Company, in whose garage the show was held, and Mr. Zell is his associate in the enterprise. Messrs. Buchanan and Atkinson are in the firm of Callahan, Atkinson & Co., agents for the Pope-Toledo and Locomobile. All of the last four named men have been identified with automobile racing since its inception here, and Mr. Buchanan holds the present State records, for a half-mile track, from one to ten miles.

The association is to hold automobile, auto boat and motorcycle races in this part of Maryland. Three motor boat races are planned for the summer and the automobile and cycle meets will occur once a week, with special events at night. Three tracks are being considered, and there is a possibility that the association will build its own oval. The water course will be over the Patansco River, which is well adapted for the purpose. The first automobile meet will be held on May 30.

HOOSIER SHOW PLANS SPOILED.

INDIANAPOLIS, April 16.—It is improbable that this city will have an automobile show in keeping with its size until a building large enough to accommodate it is erected. The proposed fall outdoor show and race meet fell through because the fair grounds were not large enough to build a two-mile track, thought to be necessary as an extra inducement, and the proposed spring show will probably not materialize because there is no building large enough in which to hold it.

Tomlinson Hall, the only building to be considered in the city, has long since fallen short of the demands of the city. It was built about twenty years ago and there is no provision for getting anything so large as an automobile into the hall.

Plans for a local show now seem to be bent toward an exhibition of some kind at the fair grounds during the State Fair in September.

STORY ABOUT JOHN WILKINSON.

An interesting bit of history was brought to light recently. Two traveling salesmen happened to meet in the office of the H. H. Franklin Mfg. Co., of Syracuse, and in talking over the early days of the automobile industry, one related the following incident as indicative of the change of sentiment and the spread of the Franklin four-cylinder idea:

"I was traveling in the interests of a roller bearing concern and stopped at Syracuse to call on the Stearns people, who were then laboring away with the steam proposition. After finishing my business, I said: 'Now is there any one else in Syracuse manufacturing automobiles?' My customer hesitated a moment and then replied: 'There is a fellow by the name of Wilkinson who is building a little car here. He is making a four-cylinder gasoline machine and, would you believe me, he is really trying to cool it by air.' Well, when I see that old customer of mine I always ask him in a joking way if John Wilkinson is still making a four-cylinder car and is really trying to cool it by air."

THIS IS DENVER SHOW WEEK.

DENVER, April 14.—All is in readiness for the automobile show which opens in this city on Wednesday, April 18, and from indications this undertaking of the local promoters will be the most successful in the history of the association. Features galore have been planned and many surprises are in store. The decorative scheme for the Denver exhibition will be copied from the Chicago and New York shows. In former years it has been customary to allow each exhibitor to array his space as he saw fit, but now the management has taken upon itself the task of decorating uniformly, artistically and more effectively. A gasoline car built by the Flint-Lomax Company, Denver, will be on exhibition.

News and Trade Miscellany.

The Norris Auto Company of Saginaw, Mich., has voted to increase its capital stock from \$12,000 to \$25,000.

An Italian car, the Bianchi, will hereafter be handled in New York by the Snutsel Auto Supply Company, at 1534 Broadway.

The New York agency of the Duquesne automobiles has been removed from 112 East Seventy-fifth street, to 306 West Fifty-second street.

The Darracq Automobile Company, of New England, has established its headquarters in the new Motor Mart, Park Square, Boston.

The Twentieth Century Automobile Company will represent the Grout automobile in Chicago, and will be located after May 1 at 1421 Michigan avenue.

After May 1 the George J. Scott Motor Car Company, New York agents for the Glide automobile, will be in new quarters at Broadway and Fifty-first street.

A Boston branch, with Allyn A. Stillman as manager, has been opened at 92 Massachusetts avenue, near Boylston street, by the Mercedes Importing Company of New York.

Manager W. E. Eldredge, of the Buick agency in Boston, has fitted up a new salesroom in the Tremont garage, that city, with offices adjoining and a modern equipped repair department in the basement of the garage.

An automobile jack patented by W. H. Burner, Jr., of Cincinnati, is to be the special product of the Medeau Manufacturing Company, of that city, for which Mr. Burner has secured articles of incorporation in Ohio.

The Adams-Sutton Company, 16 Columbus avenue, Boston, agents for the Oldsmobile, have been forced by increasing business to lease another floor in that portion of the new Motor Mart in which they are located.

Franklin cars will hereafter be sold in the Hawaiian Islands by O. E. Hall & Son, at Honolulu. Arrangements were recently made with this concern whereby the Franklin will be extensively advertised and sold throughout the islands.

President Benjamin L. Jones, of the Macon (Ga.) Automobile Club, is negotiating with the H. H. Franklin Mfg. Co., of Syracuse, N. Y., for a 90-horsepower racing machine. Houghton Woodman, who drives for Mr. Jones, will manipulate the levers.

The city of Madison, Wis., is anxious to secure the location there of the Pollock Automobile Wrench Company, of Galesburg, Ill., which is seeking a new location. The company desires facilities permitting the employment of fifty workmen, turning out 1,000 wrenches a day.

The Auto Tire Repairing Co. was recently organized in Columbia City, Ind., and installed a 2,100-pound vulcanizer with which it is vulcanizing tires under a new process invented by A. T. Mosher. The company is receiving considerable work from Fort Wayne and surrounding territory.

One hundred men are working overtime at the big Aerocar factory at Mack avenue and the Belt Line Railroad, in Detroit, Mich. The air-cooled cars are being shipped at the rate of one a day and the prospects at present are that the output will be tripled in a short time. Reports from the agencies are most satisfactory.

Requiring more space on account of a large increase in their business, the R. E. Hardy Company, maker of the Sta-Rite

plug and other automobile accessories, has moved from 225 West Broadway to 80 Watts street, New York City, where nearly twice as much floor space as was previously occupied has been obtained.

An ordinance has passed the Chicago City Council which provides that no garage shall be erected in any block in which buildings on both sides of the street are used for residence purposes without the written permission of a majority of the property owners. Alderman R. R. McCormick was the father of the bill.

"Spring Painting" is the title of the latest pamphlet issued by the Joseph Dixon Crucible Company, of Jersey City. In it is given valuable suggestions for automobile owners who contemplate refinishing their cars and doing other kinds of painting incidental to the springtime. Copies are mailed free to inquirers on application.

F. Rothschild, the Parisian builder of automobile bodies, has established an American factory at 530 West Twenty-seventh street, New York City, where he has forty men at work under a French superintendent. The business is in process of incorporation by M. J. Rothschild, son of the house, under the home title of Rothschild et Cie. J. R. Chisholm, who at one time imported the Decauville car, is interested in the business management.

H. Carter, of the Carter Motor Car Co., is completing arrangements in Detroit for the manufacture of Carter friction-drive cars for exportation by the Carter International Motor Car Co., of which he is president and general manager. A variety of cars will be produced, it is reported, including runabouts, touring cars, delivery wagons, trucks, ambulances, patrol wagons and special fire engines. Mr. Carter has disposed of his patents to the Carter Motor Car Co. and will devote his time to the export business.

After May 1 the Hartford Suspension Company will be located in its new building at Broadway and Eighty-eighth street, and the factory will be moved from Hudson street to the corner of Clarkson and West streets. This will give three times the present floor space and will permit better care to be taken of the Truffault-Hartford suspension business, which is increasing at a rapid pace. The Gobron-Brillie cars, for which the company is the agent in America, are due in two weeks, from the other side, fitted with French bodies.

Harlan W. Whipple, the well-known automobilist of Boston, has placed an order for a 35-horsepower Rainier, with touring body, to be finished in French gray. Other recent purchasers of 35-horsepower Rainiers are Robert Patterson, president of the National Cash Register Company; J. A. Culbertson and Frank M. Wright. Charles Lanier has taken delivery of a special 35-horsepower Rainier chassis, built to order, and which is now being fitted with a luxurious limousine body with all modern conveniences, by Healy.

The power boat show, which was held last week in the First Regiment Armory, Chicago, was a success in every sense of the word, and aroused great interest in motor boats. Many boats were shown from the fast craft to the little skiff. One of the boats was equipped with an automobile steering wheel, and is fitted out with padded seats like an automobile. It has a 40-horsepower engine, and is very speedy. Several fast boats were shown, some of which have figured prominently in races. Among

them were the *Black Diamond II.*, the *Violet Louise* and the *Kangaroo*.

The Hartford Automobile Parts Company has been incorporated under Connecticut laws to manufacture and deal in high grade automobile parts. Officers have been elected as follows: President and treasurer, E. A. Bardol, Hartford; secretary, A. J. Broughel, Hartford; vice-president and manager, F. H. Bogart, of New Britain. An office has been opened at 438 Asylum street, Hartford, where sufficient space has been secured, together with power, to accommodate the present needs of the company. The policy will be to produce only high grade goods of the best materials and workmanship, and to maintain this high standard in everything sold under the "Hartford" trade name. The first product of the company will be a new type of universal or Cardan joint, on which patents are now pending.

PERSONAL TRADE BREVITIES.

Herbert K. Lerick, for the past four years sales manager of the Central Automobile Company of New York, has accepted a similar position with the Frayer-Miller Motor Car Company in the New York store.

E. W. Roberts, of Clyde, O., the well-known gas engine expert, is reported to be interested in the organization of a new company to manufacture automobiles at Toledo, O., the motors to be of the two-cycle type.

John Kerwin, representing the mechanical department of the Franklin Company, is making an extended trip throughout the southern states which will take him as far south as Tampa, Fla., from which town he will cross to Havana, Cuba, and Merida, Yucatan, returning by way of Mexico City and Dallas, Texas.

Percy Owen, long and favorably known in trade circles, and for a number of years identified with the Winton interests, more recently as manager of the New York branch of that company, has resigned his position to accept that of Eastern sales manager for the Aerocar Company, of Detroit, with headquarters at Seventy-third street and Broadway, New York City. Mr. Owen has achieved a reputation at home and abroad by driving a Winton in various races and touring contests. He is one of the charter members of the Automobile Club of America, and was the first president of the New York Automobile Trade Association, and more recently its treasurer. He carries the good wishes of his many friends with him in his new business connection.

RECENT WINTON CHANGES.

Harry L. Owesney has been appointed western supervisor for the Winton Motor Carriage Company with headquarters at Chicago.

C. W. Churchill, assistant manager of the Cleveland branch of the Winton Motor Carriage Company, has been appointed manager of the Winton New York branch house, to succeed Percy Owen, resigned. Mr. Churchill had just been appointed the Winton company's eastern supervisor when Mr. Owen's resignation was received, giving the company an opportunity to promote him still further in recognition of excellent work in his Cleveland capacity. As New York branch manager, Mr. Churchill will have supervision of the erection of the new Winton branch at Broadway and 70th street, New York, which, when completed, will be the largest and finest retail automobile establishment in America. Mr. Churchill's successor in Cleveland has not yet been appointed.

INFORMATION FOR BUYERS.

FIRST AID OUTFIT.—A neat and compact case containing the proper medicants and means for affording immediate relief in case of burns, cuts and bruises is put up for the use of automobilists by the United States Emergency Case Company, of Utica, N. Y. It is highly important that proper antiseptic measures be taken in case of cuts and lacerations, and for the purpose of dressing such wounds the case contains a pair of scissors, antiseptic dressing, antiseptic lint, antiseptic waterproof liquid court plaster, absorbent cotton and bandages. There is also ointment for burns, and various other articles. These are carefully packed in a light metal case in airtight receptacles that will keep them fresh for an indefinite period. In the case is also a booklet on "First Aid to the Injured." It is a valuable outfit to carry in the car at all times.

CHAMPION FILTER FUNNEL.—This is a strainer for separating water and dirt from gasoline constructed on a new principle and placed on the market by the Iver Johnson Sporting Goods Company, of Boston. It is called the Champion Filter Funnel and operates by the action of gravity. The gasoline first runs to the bottom of the strainer, then rises through the filter, as indicated by the arrows in the illustration, and goes out



CHAMPION FILTER FUNNEL.

the opposite side of the funnel into a pipe conveyor leading to the tank. All water and dirt remain at the bottom, which can be easily unscrewed and cleaned. It will be noticed that the gasoline is filtered upwards and not downwards. This insures removal of water for a certainty, as it will fall to the bottom of the funnel under the strainer, if the funnel is kept upright in position.

STEEL BELT.—Sometimes the overheating of cylinders and bearings is due to the slipping of the leather belt which runs the oil pump, for if the belt slips the efficiency of the pump is impaired, and improper lubrication results. The Philadelphia Ornamental Wire Company has introduced the Powco steel belt, an article designed to eliminate these troubles. This belting is made from a wonderfully tough and durable steel wire, is as pliable as leather, but, according to its makers, will not stretch or break, and is very easy running. An instance cited in proof of this is a test recently made. A 23-inch Powco steel belt was used over a 41-inch run for 60 days and when taken off for examination it was found not to have stretched a fraction and was in every way as good as new. The manufacturers guarantee every belt that they turn out to be as represented.

ELECTRIC CIGAR LIGHTER.—Automobilists who smoke will be interested in this novelty. An illustration of which we present in connection with this article. Not only is it serviceable for lighting a cigar or pipe by a push of the button while the car is running, but if you remove the plug and put in a lamp (which comes with it), you have an electric light as well as a lighter, to use to

look your machine over in case of trouble. The device works four volts, and can be used on the sparking set of any touring car. If you have a six-volt battery you can con-



CIGAR LIGHTER.

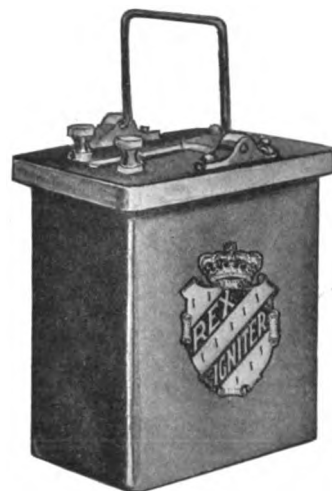
nect it upon two of the cells. It can also be connected up on two of the cells of any electric machine. It is made by the Rochester Automobile Company, of Rochester, N. Y.

SCREWS AND BOLTS.—For more than two years the electric welding process has been applied to screw manufacture by the Cleveland Cap Screw Company, of Cleveland, Ohio. By this process the stems and heads are cut from different bar stock, of the same quality, in automatic machines. The heads and stems are then placed in the welding machine and held firmly by copper vises, which are clamped to gun-metal platens. These platens are moved on steel ways by hydraulic pressure. The sections to be welded are brought together, completing the circuit, and the current is then allowed to pass through the sections until they are brought to a welding heat, at which time a greater pressure is applied, forcing the two together, expelling any possible slag or deteriorated metal and forming up a burr, which is then milled down by special machinery. The blanks are threaded by special machinery also, the entire process resulting in the utmost accuracy in the size, alignment and thread of the screw. Combinations of brass, copper, Tobin bronze and Muntz metal to steel and of brass to brass and bronze to bronze can also be made.

IGNITION BATTERIES.—Rex "Igniters" are manufactured by the New England Motor Co., of Lowell, Mass., and are put up in all the usual size—40, 60 and 80 ampere-hour capacities, and 4, 6 and 8 volts. The elements are of the pasted type, the active material being applied to grids made of a non-oxidizable alloy. The composition used in mixing the active material for the positives produces a very dense peroxide having no local action, so that abnormal lasting

qualities are secured. In many instances batteries have been operated from April to October, in launches, without recharging, it is asserted. The elements are assembled in hard rubber compartment jars, thoroughly sealed, with hard rubber covers and vents. Valves to prevent slop-page are a feature of this battery, and have proved a great convenience. Compartment cells of another type are made up of individual hard rubber jars, assembled in a hardwood box with a shock-absorbing medium between the rubber and the wood.

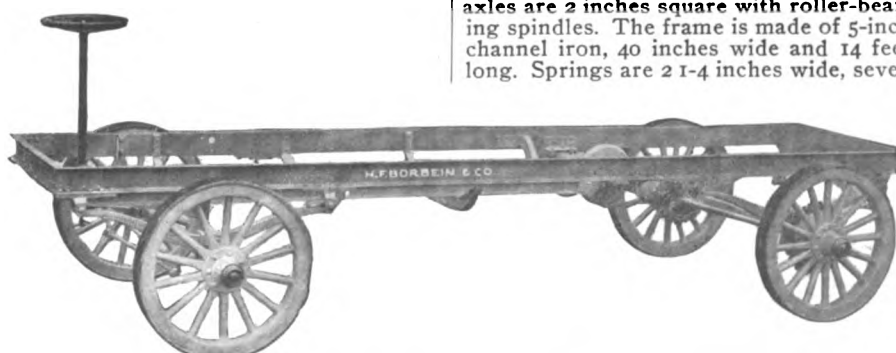
Another innovation by the New England Motor Company is the placing on the market of a line of storage units. These consist of small hard rubber jars which are thoroughly sealed and furnished with valves and terminals. The user can purchase any desired number, and place them in his auto or launch just the same as dry cells. A number of advantages follow, for example: It sometimes happens that a person may have bought a 4-volt outfit, and afterward find that a 6-volt would be preferable. In order to get what is



REX IGNITION BATTERY.

wanted by the old method he would have to discard his old set and purchase another unit of the proper capacity. Or an accident may have happened to one cell. If in a set, the whole set is spoiled; but on the unit system he can buy another unit to take the place of the imperfect one, at about one-third of the cost.

RUNNING GEAR.—H. F. Borbein & Co., 3109 N. Ninth street, St. Louis, Mo., have just brought out the side-chain-drive running gear for trucks, illustrated herewith. This running gear is designed to carry 3,800 lbs. above the axles. Front and rear axles are 2 inches square with roller-bearing spindles. The frame is made of 5-inch channel iron, 40 inches wide and 14 feet long. Springs are 2 1-4 inches wide, seven



BORBEIN SIDE-CHAIN DRIVE RUNNING GEAR FOR HEAVY TRUCKS.

leaves in front and eight leaves in the rear. Wheels are of the artillery pattern with steel hubs, 2-inch hickory spokes and wide wood felloes, with channels for 4 by 36-inch solid rubber tires. The rear wheels have sprockets with brake drums rigidly attached. The sprockets are cut for 1 1/2 by 5-8-inch roller chain, with thirty-four teeth. The countershaft has a heavy bevel gear, with horizontal drive shaft. The steering device is of the worm and gear sector pattern, which is positive and gives no back lash. Tread is 60 inches. These truck running gears are made with any size of frame and any height of wheels; also with a live rear axle for single chain drive, and the frame is made with or without sub-frame, as desired.

The Borbein Company has brought out a coupé body for the trade. It is designed for physicians. It is 36 1/2 inches wide and 107 inches long at the bottom. The distance between the extreme front part and the main body is 25 inches. It has a lid on top of the rear part. These bodies are furnished in the white with one coat of 'bad paint, or with bevel edge glass, painted and upholstered in dark green or black leather, diamond tufting with silk spring roller curtains. This body was made to take a fancy metal hood.

NEW TRADE PUBLICATIONS.

NEW YORK SPORTING GOODS CO., 17 Warren street, New York.—Catalog of 64 pages, containing illustrations, brief descriptions and prices of a complete line of standard automobile accessories and supplies. It shows the latest goods, both domestic and foreign, now in the market. This latest issue of the company's catalogue is designated No. 34, and can be obtained by writing to "Department M," at the above address.

MATHESON MOTOR CAR CO., Wilkes-Barre, Pa. (The Matheson Co., 1619 Broadway, New York, selling agent).—Twenty-four-page art catalogue showing superior half-tone illustrations of the Matheson touring

car in the chassis, and fitted with runabout, touring, and limousine bodies. Also views of the engine from four sides. As a new product is shown the Matheson five-ton truck. Printed in black, with headings and borders in orange; cover of lavender color, as for several years past.

CENTURY AUTO-POWER CO., East Orange, N. J.—Sixteen-page catalogue calling attention of steam car users and persons who contemplate building their own cars to the Century system of flash steam generation with a kerosene burner, as applied to runabouts, touring cars, light and heavy commercial vehicles, launches, yachts, and for stationary purposes. Illustrated with half-tone engravings from photographs of seamless tube generator; boiler and burner complete, thermostat, packingless throttle, and gauges.

LOCOMOBILE COMPANY OF AMERICA. Bridgeport, Conn.—A superior catalogue of unusual merit, illustrating and describing in minute detail the mechanical features of the 1906 Locomobile cars. It is free from generalities and absurd claims and contains much real information about these cars. An interesting feature is the historical introduction reviewing the performances of the Locomobile in the endurance run of 1902 to Boston, the New York-Pittsburg run of 1903, the Glidden tour last year and in the 1905 Vanderbilt Cup race.

TRADE NOTES.

The Lubeck Automobile Company, of Grand Rapids, Mich., has incorporated with a capital of \$15,000.

The Reo Car Company, of Lansing, Mich., has filed amended articles of incorporation, changing the name of the concern to the Reo Motor Car Company.

The Grand Rapids police department has announced an intention of warring on automobile drivers who overrun the speed limit and that the "cycle cops" will again go into commission.

At the request of the E. H. V. Company, of Middletown, Conn., the Massachusetts Institute of Technology made a test of a

motor of the type used in the compound cars. The institute granted a certificate of high efficiency to the company on the results of the test. Every detail in the manufacture of Compound cars is said to be carried out at the Middletown factory.

Roy Chapin, formerly sales manager of the Olds Motor Works, has been spending the past month in Southern California, at Los Angeles. He is considering entering the trade as a manufacturer of cars on his return East.

Among the buyers of Lozier cars during the past week were A. Krower and Charles Kaye, of this city, and Henry L. Hotchkiss, of New Haven. Milliard F. Smith, who has had a Lozier limousine since last September, has secured a 40-horsepower Lozier touring car.

A \$50,000 addition to its plant in Detroit is the latest move of the Packard Motor Car Company, which will build two new buildings, one to be 480x63 feet, and the other 248x63 feet. Each building will be two stories high, and when completed will furnish employment for 500 additional hands.

"What Owners Say about National Cars" is the title of a little 64-page booklet just issued by the National Motor Vehicle Company, of Indianapolis, Ind. The National people shipped about 200 cars last season and there are 58 duplicate letters in the book mentioned above, from National owners who used Model C touring cars during 1905. The company feels that it has a very fair percentage of highly satisfied customers, considering the size of its output.

The Maxwell-Briscoe Motor Car Company has been making an estimate of the floor space in its various factories at Pawtucket, R. I., Tarrytown, N. Y., and Chicago. The total space is considerably in excess of 255,000 square feet, without the inclusion of vast platform and yard space at Chicago. This, it is estimated, is still 150,000 square feet less than the company needs to carry forward the work of making Maxwell cars now under order. Additional facilities will be provided at an early date.

INDEX TO ADVERTISERS

Acetylene Gas Illuminating Co.	33
Acme Motor Car Co.	79
Add-Wear Tire Sleeve Co.	82
Aerocar Co.	31
Am. Anti-Puncture Tire and Auto Co.	36
American Coil Co.	33
American Generator Co.	42
American Lubricator Co.	37
American Motor Truck Co.	70
American Veneer Co.	40
Anderson Forge & Machine Co.	37
Archer & Co.	33
Artisan Brass Co.	51
Ashton Valve Co.	32
Aster Co., L.	58
Atwood Mfg. Co.	33
Auburn Automobile Co.	76
Auto Pump Co.	34
Auto Safety Starting Crank Works.	32
Auto Top and Equipment Co.	35
Automobile Equipment Co.	84
Automobile Supply Co.	34
Badger Brass Mfg. Co.	39
Baker Motor Vehicle Co.	79
Baldwin Chain Mfg. Co.	74
Bemis, T. Alton.	41
Berkshire Automobile Co.	91
Beverly Mfg. Co.	37
Bicycle Step Ladder Co., M. E.	35
Blasler Mfg. Co., M. E.	35
Boker & Co., H.	33
Borbein & Co., H. F.	40
Boston Mechanical Co.	38
Bowser & Co., S. F.	55
Boyle & Co., John.	59
Brennan Mfg. Co.	48
Briscoe Mfg. Co.	37
Brownell-Trebert Co.	42
Brown, R. E.	42

Brown, W. H.	77
Brown & Co., S. N.	35
Buckeye Mfg. Co.	87
Bullard Automatic Wrench Co.	Cover
Bullard, J. H.	42
Buob & Scheu.	35
Byrne-Kingston Co.	62
C., B. & Q. Ry. Co.	45
Cadillac Motor Car Co.	80
Capitol Foundry Co.	37
Central Garage.	36
Chalfonte Hotel.	51
Champion Co., A.	32
Champion Mfg. Co.	32
Chase & Co., L. C.	41
Chelsea Clock Co.	32
Chicago, M. & St. P. Ry.	39
Clark, E. P.	36
Cleveland Motor Car Co.	81
Collins & Sons, G. A.	35
Columbia Lubricants Co.	50
Connecticut Tel. & Electric Co.	32
Continental Caoutchouc Co.	67
Continental Motor Mfg. Co.	36
Coops Co., C. W.	35
Corbin Motor Vehicle Corporation.	83
Covert Mfg. Co.	34
Crawford Automobile Co.	76
Cullman Wheel Co.	37
Cushing, L. M.	42
Dayton Electrical Mfg. Co.	64
Deere-Clark Motor Co.	77
Diamond Chain & Mfg. Co.	37
Diamond Rubber Co.	70
Dietz, R. E.	54
Diezemann Shock Absorber.	64
Dixon Crucible Co., Joseph.	46
Domnick Co., Wm.	41
Dorris Motor Car Co.	76
Dover Stamping & Mfg. Co.	32
Dow Portable Electric Co.	36
Duff Mfg. Co.	53
Duplex Coll. Co.	39
Duquesne Construction Co.	33
E. H. V. Co., The.	79
Eastern Carbon Works.	50

Eclipse Buggy Co.	35
Edmunds & Jones Mfg. Co.	33
Eldredge Electric Mfg. Co.	34
Electric Rubber Mfg. Co.	36
Electric Vehicle Co.	74
Electrical Mfg. Co.	33
Elmore Mfg. Co.	91
English Daimler Co.	42
English & Mersick Co.	33
Erle Railway.	58
Excelsior Supply Co.	32
Fairmount Engineering Works.	34
Firestone Tire & Rubber Co.	Cover
Fisk Mfg. Co.	53
Ford Motor Co.	38
Forest City Motor Car Co.	43
Fox Reversible Engine Co.	51
Franklin Mfg. Co., H. H.	93
Franklin Portable Crane & Hoist Co.	41
G & J Tire Co.	72 and Cover
Gabriel Horn Mfg. Co.	65
Garage Equipment Co.	34
Garford Co., The.	43
Gearless Transmission Co.	57
Gilbert Mfg. Co.	40
Glover, George E.	34
Goodrich Co., B. F.	68
Goodyear Tire & Rubber Co.	71
Graham Cycle Co., E.	40
Gramlich Chemical Co.	33
Grand Hotel.	58
Gray-Hawley Mfg. Co.	34
Ham Mfg. Co.	54
Hardy Co., The R. E.	33
Harris Oil Co., A. W.	43
Harrison Wagon Co.	89
Hartford Rubber Works Co.	68
Hartford Suspension Co.	44
Hassler Co., O. C.	22
Hatcher Auto Parts Co.	35
Havemeyer Oil Co.	32
Hawkins Mfg. Co.	36
Healy Leather Tire Co.	71
Heinze Electric Co.	38
Hicks Speed Indicator Co.	65
Hine-Watt Mfg. Co.	42

THE AUTOMOBILE

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No. 17

ELEVEN HOOSIERS CLIMB AN INDIANA HILL.

INDIANAPOLIS, IND., April 23.—Michigan Hill is one of the steepest grades in Central Indiana, though it is only a half mile long and not more than eighty-five feet high. Located five miles north of Indianapolis, it serves as a favorite trying-out grade for Indiana automobilists.

A regularly organized and officially conducted climb is to take place during the latter part of May, so the other day eleven Hoosiers decided to try their skill in surmounting the half-mile incline. An Olds, a Franklin and a Winton were the three most successful climbers. Each car carried its full equipment and three

passengers, one of whom was the driver. S. W. Elston piloted the winning Olds in 54 seconds; Charles Talbott guided the Franklin up the hill in 51 seconds, and Charles Newby ascended with the Winton in one minute. Only a single trial was allowed each car, and the narrowness of the road allowed only one vehicle to start at a time. Though the figures cannot be accepted as official, despite the excellent clocking of Frank Melcher, B. F. Meixell and O. L. Weaver, the results give an excellent idea of what may be expected in the adver-

tised open contest. The hill was in perfect condition, and it is to be hoped that the same situation will exist on the May date.

The start was made from a complete standstill and the event was held under some difficulty, as it was impossible to keep all other vehicles off the hill. Both the Winton and Franklin had only arrived from the factory during the morning, and the latter had been driven from Lima, O., the day before and no unusual preparation was made for the climb.

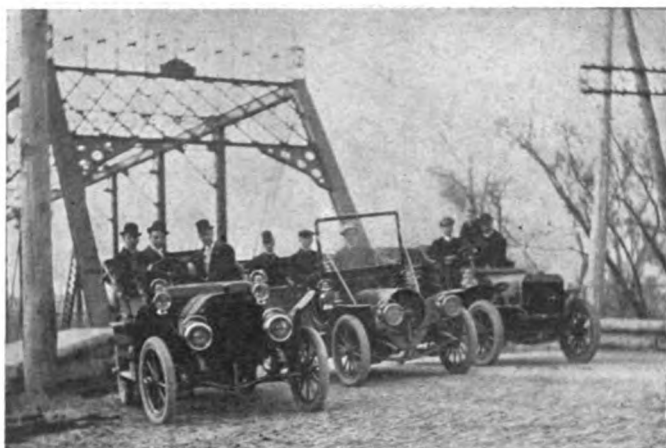
Talbott in the Franklin had a narrow escape from accident. When about half way up the hill a wagon drove out on the road

from an adjoining field, and it was only by dextrous steering that a collision was avoided. The farmer took the close call good naturedly, though he could have been very disagreeable about it had he so desired, for the automobilists had no permit to use the road for a preliminary climb. Perhaps the farmer hopes to benefit when the actual event is held.

While the average Indiana road could be improved upon, the Hoosier State possesses many miles of rideable highway, and the spread of automobiling is certain to be very rapid.



S. W. ELSTON PILOTING THE WINNING OLDS UP MICHIGAN HILL, NEAR INDIANAPOLIS.



THE FIRST THREE CLIMBERS—OLDS, FRANKLIN, WINTON.

The farmer is looking with longing eyes at the motor-driven vehicles which pass him on his way to town, and it is dawning on him that the horseless vehicle is a great time saver. Not a few farmers have succumbed to the new method of transportation, and this more than anything else terminates quickly the antagonism which the automobile still meets with in remote parts of the state. Of course, the roads question is becoming a vital one, and interest in it is apparent on all sides. The rainy season is a dreaded period for those off the main highways, for some of the Indiana roads are at this time only such in name. It is as certain as the rising of the sun that the average farmer after investing in an automobile is going to be a most persistent shouter for highway improvement; at least that is the impression one gets from observing things in Indiana.

INTERNATIONAL CUP FOR AERONAUTS.

The Coupe Internationale des Aeronautes will be contested for at Paris, France, on September 30. The following countries will be represented in the entry list: France, Belgium, Great Britain, Germany, Italy, Spain and America. Frank S. Lahm and M. Santos-Dumont will represent this country under the colors of the Aero Club of America. The limit set on the capacity of the balloons is 2,200 cubic meters. Many balloons are being specially constructed for the contest, and great interest is being manifested by all the aero clubs in the various nations that will be represented.

Lord Howard C. Walden has presented the Technical Committee of the British Aero Club with \$500 for the purpose of theoretical investigation and, in the event of a practical machine for aerial navigation being forthcoming, he will make a further contribution toward the expense.



RAYMOND HEALY, IN A ZUST, IN PROSPECT PARK, BROOKLYN.

CLOUDLAND BRIGADE ECHOES.

Members of the New York Motor Club, which has taken unusual interest in the North Pole expedition of Walter Wellman, Monday night at the Waldorf-Astoria informally said farewell to the air navigator, who sailed early Tuesday morning on the *Kaiser Wilhelm II*. His airship will carry the pennant of the New York Club, and, of course, will float the American flag.

Going direct to Paris, Mr. Wellman will make many ordinary ascensions and thus become familiar with aerial conditions, but the entire party will assemble at Tromsø, Norway, early in June. The ice steamer *Frithjof*, which has been chartered for two years, will sail for Spitzbergen about June 20. Toward the end of July the airship experiments should be in progress. A start for the North Pole, 600 miles from Spitzbergen, may be made early in August. In the airship will be two motor sledges with 3 1-2-horsepower engines, that will be utilized in case of emergency. Maxwell J. Smith, a wireless telegraph expert, will be one of the party of five, which will include Major Henry B. Hersey, of the National Geographical Society, and two Frenchmen, one of whom will be Gaston Hervieu, an aeronautical expert.

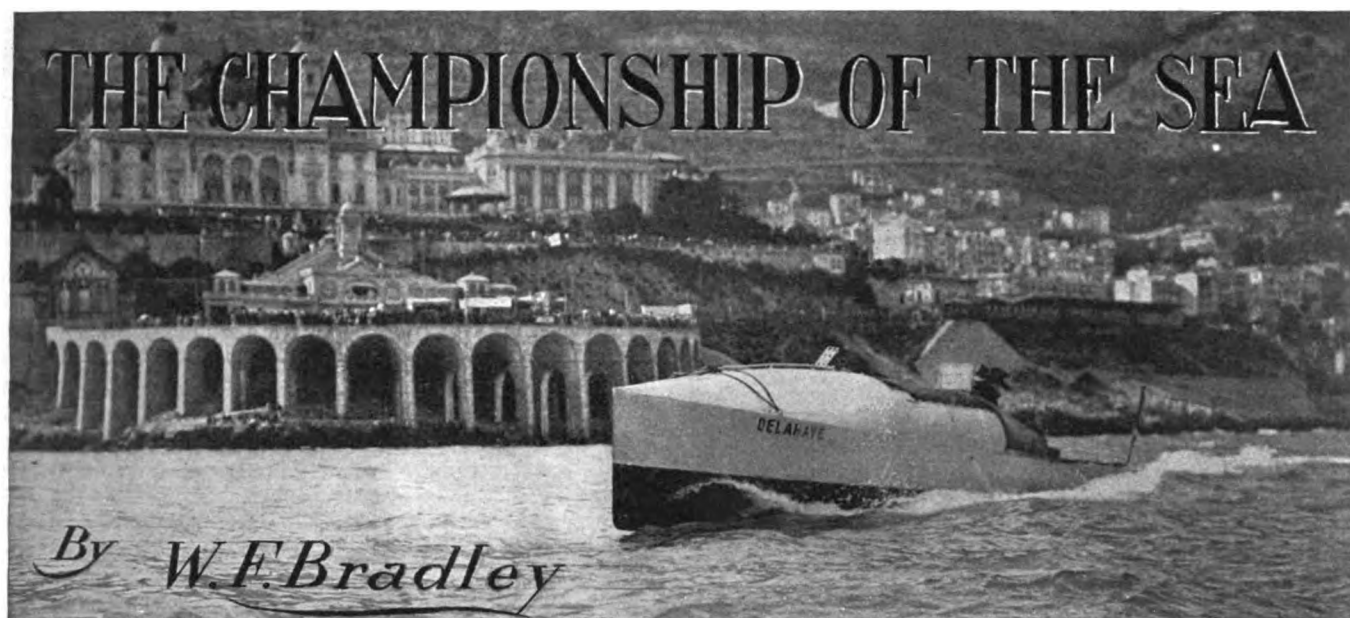
"Besides these five men," said Mr. Wellman, "the immediate members of the expedition will include several others. Dr. W. N. Fowler, of Bluffton, Ind., will be the physician and surgeon; Felix Riesenbergh, of Chicago, a former member of the United States Coast and Geodetic Survey, will have special charge of the nautical instruments; Alexander Liwenthal, who was associated with Count Zeppelin in the famous airship experiments in Germany and Switzerland, will join the party in Paris. We are also going to take an Adirondack guide. Francis H. Buzzacott is the man. His father was a guide, and he has had experience in Arctic and Antarctic regions."

In order to facilitate the receipt of wireless telegraph messages from the airship, two wireless telegraph stations are to be erected, one at Hamarfest, Norway, and the other on the steamer *Frithjof*, at Spitzbergen. If the airship reaches the pole, news will be sent through the air by Mr. Smith to the station at Spitzbergen, then it will go to Hamarfest, where it will be sent by Cable to America.

"I heard from Louis Godard this week by cable," said Mr. Wellman, "and he says the work is progressing very satisfactorily. The balloon will hold 224,000 cubic feet of gas. It will have an inclosed canvas cabin, in which will be the engine room, sleeping quarters, and there will be decks fore and aft. Its total lifting power will be 16,000 pounds. The frame, the anchor, and the ropes will be of steel, and the machine itself will weigh 7,500 pounds."

Aero Club of America members Monday noon at the Lawyers' Club, New York City, entertained at luncheon two noted foreign aeronauts in the persons of Count Henry de la Vaulx, vice-president of the Aero Club of France, and Patrick Y. Alexander, of the Aero Club of the United Kingdom. Captain Homer W. Hedge, president of the Aero Club, was the toastmaster, and, of course, the remarks were of a very optimistic kind regarding the future of air navigation. Such highflyers as A. M. Herring, Leo Stevens, Charles Levee, Charles M. Manley, and Cortlandt Field Bishop were among those present, which included also Chairman J. D. Thompson, of the A. A. A. Racing Board, Augustus Post, Allan R. Hawley, H. M. Swetland, C. J. Edwards, S. H. Valentine, L. H. Dyer, C. E. Miller, S. M. Butler, W. R. Kimball, and Carl Dienstbach.

Dr. Kurt Wegener and his brother, Dr. Alfred Wegener, two German scientists attached to the Aeronautical Institute at Lindenburg, have been successful in breaking, by eleven hours, Count de la Vaulx's long-duration trip of forty-one hours. Starting on the morning of April 5 from the grounds of the military ballooning corps, at Tegel, near Berlin, they descended at midday on April 7, at Aschaffenburg, in Spessart, after having been suspended in the air more than fifty-two hours.



THE 400-HORSEPOWER DELAHAYE, WINNER OF THE GREAT LONG-DISTANCE EVENT OF THE ANNUAL MONACO MEET.

MONTE CARLO, April 13.—The most interesting event of the whole meeting was the "Championship of the Sea." Twenty-four boats, nine of them racers, the rest cruisers, came to the starting line as representatives of France, Italy, England, and Germany.

Calypto, a French cruiser carrying a Mors motor, got over the line first, followed by the racers *Rapière*, the *Fiat*, and the huge *Delahaye*, while the rest came on in a fairly compact group. Two hundred kilometers had to be covered over a 50-kilometer pentagon, making twenty rounds in all.

At the end of the first round the Italian *Fiat XIII*. had taken the lead, with the French boat *Delahaye* about 100 meters astern, followed by *La Rapière* closely pursued by the 16-cylinder *Antoinette IV*. *Delahaye-Nautilus*, a big Delahaye cruiser, went by only three minutes later, with *Yarrow-Napier*, the English champion, at her heels, and the rest of the competitors more widely separated.

At the fourth round *Fiat XIII*. was still ahead, going perfectly, the big *Delahaye* sticking close behind her, and *Antoinette* had got ahead of the *Rapière*, making a very exciting spurt. On the

sixth round only fourteen craft were left out of the twenty-four competitors, but so keen was the struggle that it was still impossible to predict the winner, and, in fact, it was anybody's race for the next twelve rounds.

As in so many recent speed tests on land, France and Italy were racing neck and neck. *Fiat XIII*. kept her lead on *Delahaye*, sometimes increasing it to about a kilometer when in the calm inshore water, and again losing it when in the open, where the *Delahaye's* sea-going qualities gave her an advantage and brought the distance down to 200 meters between the two champions. *La Rapière* had to give way to the *Yarrow-Napier*, which had her companion Napier craft, the *Siola* in her wake, and the two Mercedes boats, *Mercedes W. N.* and *Mercedes D. L.*, displacing tons of water not far astern.

Matters remained thus with little change up to the eighteenth round. Tellier had been obliged to enter port, as the *Rapière* was taking in water, and the Italian and French champions, both steering marvelously well, kept up their interminable struggle, neither of them having stopped since the commencement of the race, and the time between them never having varied more than



FIAT XIII. LEADING THE WAY FOR THE YARROW-NAPIER—THE FORMER WON THE PRINCE OF MONACO CUP IN THE MILE EVENT.

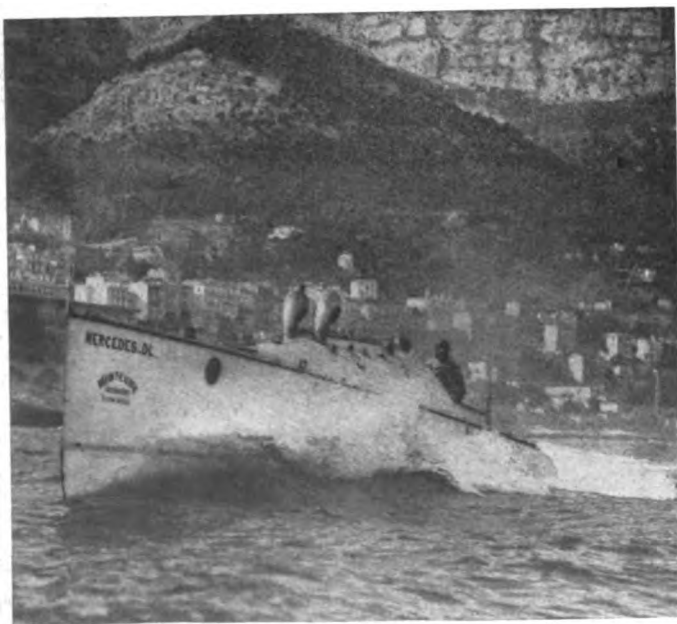


THE ZUST, A PROMISING ITALIAN NEWCOMER TO THE LISTS.

two minutes. *Fiat XIII.* had on board, in addition to her builder, M. Taroni, who was acting as pilot, her engineer, and Lancia. The *Delahaye* was steered by M. Perron, and G. M. Varley, the designer of the engines, was personally looking after the motor.

Suddenly, on the eighteenth round, while on the seaward leg of the course, *Fiat XIII.* suddenly stopped. *Delahaye* passed ahead, followed by the *Antoinette*. Owing to a miscalculation, the essence on board the *Fiat* had given out six miles from the end of the course. Lancia had taken an extra can on board in case of emergency, but before it could be emptied into the tank, which is under pressure, the race was lost, the *Yarrow-Napier* and the *Fiat* being neck and neck when the latter restarted. Again the Italian went to the attack, leaving the *Yarrow-Napier* some distance astern, but it was too late to regain the lost position, and the race finished as follows:

- | | |
|---|---------|
| 1. <i>Delahaye</i> : 400 H.P. and 16 H.P. auxiliary motor; hull, Brosse and Fouché..... | 4:40:12 |
| Average, 26.6 miles an hour. | |
| 2. <i>Antoinette</i> : Motor, Levavassor; hull, Pitre & Cie..... | 4:42:53 |
| Average, 26.3 miles an hour. | |
| 3. <i>Fiat XIII</i> : Motor, Fiat; hull, Taroni..... | 4:46:31 |
| Average, 25.9 miles an hour. | |
| 4. <i>Yarrow-Napier</i> : Motor, Napier; hull, Saunders..... | 4:47:38 |
| Average, 25.6 miles an hour. | |



MERCEDES D. L., ONE OF THE MONSTERS OF THE MEET.

- | | |
|---|---------|
| 5. <i>Vol-au-Vent</i> : Motor, Hotchkiss; hull, Pitre & Cie..... | 5:56:41 |
| 6. <i>Delahaye-Nautilus</i> (cruiser): Motor, Delahaye; hull, Deschamps and Blondeau..... | 6:21:47 |
| 7. <i>Mercedes, W. N.</i> : Motor, Mercedes; hull, Bremerhaven..... | 6:29:58 |
| 8. <i>Mercedes, D. L.</i> : Motor, Mercedes; hull, Decout-Lacour..... | |

The fastest round was done by the winner, *Delahaye*, in 12:30, being an average of 29.8 miles an hour.

One of the closing events of the meet, and scarcely second in point of interest to the "Championship of the Sea," was the one-mile dash for the Prince of Monaco cup. Herein *Fiat XIII.* belied her unlucky numerals, for she traveled at a speed of 32 miles an hour and gained possession of the coveted trophy.

ONE-ARMED DRIVER OF HOLLAND.

With his right arm amputated, Samuel W. Miller, of Holland, Mich., manages his automobile with the greatest dexterity, day or night, with his left hand. He has made many trips to Grand Rapids and other cities within a radius of forty miles. He drives a Wolverine of 18 horsepower.

He has had only one serious accident during several years driving, and he speaks of that as a miraculous escape from death. He was driving down a steep country road one windy afternoon when his hat blew off. Unconsciously he reached for it with his left hand, letting go of the lever. One of the forward wheels struck a small stone in the road, turning the machine off into a ditch. The auto was overturned but only slightly damaged, and Mr. Miller escaped without injury. There has been considerable talk of Mr. Miller entering the derby races at Grand Rapids.

TO USE CARD AS BOND.

CHICAGO, April 23.—Another effort is to be made to induce Mayor Dunne to sanction the proposition of Joseph H. Francis, president of the Austin Automobile Club, to order policemen to accept cards from automobile owners instead of compelling them to give bonds at police stations.

The cards, which are to be numbered, will be issued by responsible casualty companies operating in Chicago. The owner or chauffeur will be given one to carry in his vest pocket, while a tag with a corresponding number will be attached to the rear of the machine. The proposition also will be made to the presidents of the different park boards.

A. A. C. OF N. J. WILL DISCUSS NEW LAW.

TRENTON, N. J., April 24.—The directors of the Associated Automobile Clubs of New Jersey will dine at the Trenton Country Club, May 3, and will then discuss the new automobile law and other important matters connected with the association. Many of the most prominent automobilists of the state will attend.

G & J 'FRISCO BRANCH DESTROYED.

The San Francisco branch of the G & J Tire Company was completely destroyed in the big fire that followed the earthquake, but none of the employees was injured. Temporary headquarters have been established in Oakland, but business will be resumed in San Francisco as soon as practicable.

BARNEY OLDFIELD'S NEW RACING CAR.

It had been the intention of the Peerless Motor Car Company to ship Barney Oldfield's new racer to the Pacific coast, but in view of the recent disaster there it was decided to abandon the trip. Therefore Oldfield will not have an opportunity of trying out the new flyer until later on.

NO SPEEDWAY FOR COMMODORE BOURNE.

Commodore Frederick G. Bourne, a well-known member of the Automobile Club of America, says there is no truth whatever in the statements that he is constructing an automobile speedway on his estate at Oakdale, Long Island.

WHAT IS BEING DONE BY LEGISLATURES.

BOSTON, April 23.—Considerable in the way of automobile legislation has been accomplished the past week by the legislative Committee on Roads and Bridges, which has in charge all propositions for changes in the law relating to motor vehicles. Early in the week the sub-committee of the Committee on Roads and Bridges, to which was referred the different measures affecting speed and changes in the punishment clause, reported a bill to the full committee. This bill is substantially the measure which was outlined in *THE AUTOMOBILE* of April 5. It contains clauses increasing the speed limits from ten and fifteen miles, as they are at present, to twelve and twenty miles. The bill also contains the provision by which unintentional offenses may be placed on file, while for intentional or willfully dangerous driving the offender may be punished by imprisonment. It is, in fact, the compromise measure suggested by counsel for the Massachusetts State Automobile Association after consultation with other parties interested.

The full committee has also reported the bill which was drafted at the desire of the Highway Commission, giving that body enlarged powers in the administration of the law. This bill empowers the commission to make such additional regulations as it may find necessary for the government of automobiles and automobilists, but the commission under this bill may not regulate speeds. If this bill becomes a law one of the new regulations which the commission is likely to put into effect is one that will make it possible to identify the individual cars of a manufacturer or driver. This it will do by requiring that a series of letters be prefixed to the registration numbers.

The bills, to which the automobilists looked to prevent the enforcement of the law by the country constable for purposes of revenue, have gone by the board. These were the bills under which the money received from automobile fines would go to the State for better roads instead of to the towns and cities. This was recognized as an effective means of stopping the enforcement of the law for revenue, but it was realized that if the measures were tacked on the speed law there would be no favorable legislation, for the country legislators would not vote away any of the revenue of their respective towns. These bills were, therefore, reported on adversely and the report of the committee was accepted.

The committee was taken on a tour of inspection and instruction as the guests of the State Automobile Association. Friday ten members of the committee, one senator, and nine representatives were taken by President Speare and other members in their automobiles and were driven over the road to Worcester. On the way some of the traps which have been used against automobilists were pointed out, and the legislators were also given a practical demonstration of the velocity of a machine when it is moving at the rates of speed now permitted, and moving at the twelve and twenty-mile rates proposed. They were also shown the possibility of controlling an automobile, and tests were made to demonstrate the space in which a car could be brought to a dead stop when going at different speeds. In the evening the committee was entertained by the Worcester Automobile Club, and Saturday a visit was made to the traps in Leicester, made famous by the hold-up of the Glidden tourists last summer.

The members of the committee are said to be in favor of the compromise bill and the increased speed limit, and there is very good reason to believe that the bill will be reported to the legislature as reported to the committee by its sub-committee.

Massachusetts Committee Visits Mr. Quinn.

WORCESTER, MASS., April 23.—The Massachusetts legislative committee was in Worcester and the famous Leicester district Saturday and Sunday. After a tour of the Worcester park system, the party headed for Leicester. Here on the now famous trap course the party was met, by appointment, by "Auto Jim"

Quinn, chief of police, Officer Gagen, and Selectmen Bell and Whittemore. The question of speeding was talked over, and was freely discussed by all present. Quinn appeared to be willing to aid the committee in every possible way, and with his assistant gave a demonstration of the manner in which cars are timed. The measured course is exactly 254 feet, one-twentieth of a mile, and is laid between the hills coming into Leicester from the west and the one in the center of the town. As one of the party put it: "Quinn appears to be acting in good faith, but——"

The party included: Senator Harrie C. Hunter, Marlboro, chairman of Senate committee; Representative Samuel L. Porter, Amesbury, chairman of House committee; Charles Weir, Lowell; William L. Weeks, Everett; J. F. Downey, Cambridge; J. Frank Donahue, Grafton; Amos A. Phelps, Rockland; Arthur L. Mason, Haverhill; Noble B. Turner, Barrington; Bart Bosidy, Lee; and James F. McDermott and E. A. Gilmore, Boston, and James W. Murphy. President John P. Coughlin, of the Worcester Automobile Club, also assisted in the local part of the tour.

DO YOU INDULGE IN STIMULANTS?

PHILADELPHIA, April 23.—"Do you indulge in alcoholic stimulants, and to what extent?" will be one of the questions asked applicants for New Jersey automobile licenses by the examiners who will be detailed by Commissioner of Motor Vehicles J. B. R. Smith to pass upon their qualifications. Mr. Smith believes that no one who uses alcoholic liquors to excess is a proper person to be granted a license, and his orders to the examiners are to exclude all such. Just where the dividing line between moderation and excess is located is not stated, and it is quite possible that some injustice may be done if this order is interpreted too literally by an examiner of prohibition tendencies.

As but two months will intervene between the time when the new department will be in a position to examine applicants for licenses and the date when the law goes into effect, there is some anxiety manifested, not alone in New Jersey, but in adjoining States, as to just how long and how thorough said examination will be. Unless it be of the most perfunctory sort, it will be manifestly impossible to examine and license the 25,000 or more applicants in sixty days, and yet after July 1 it will be illegal to drive over New Jersey roads without a license issued after successfully passing an examination. Even working Sundays, this will mean that upward of 400 must be examined and licensed daily—over one a minute during the usual 9-to-3 working day of the State departments. It will therefore be necessary to establish registry stations in the larger cities of the State, and at points adjacent to New York and Philadelphia, if the vast registration is to be completed in time.

Automobilists are beginning to wonder whether "the chief of police or other proper person" who may be detailed by the Commissioner to examine them will be able to determine whether or not an applicant knows the game well enough to be trusted with a license.

AS A JERSEYMAN SEES THE NEW LAW.

TRENTON, N. J., April 23.—The opinion of John E. Gill, secretary of the Associated Automobile Clubs of New Jersey, on the Frelinghuysen law is as follows: "I am sorry that such a measure as this has gone through our legislature, but it is only a warning to the reckless drivers who have indirectly caused its passage to be more careful in the future, or next year a law will be passed that will practically prohibit the pastime in New Jersey. My personal opinion of the measure, however, is that it is all that we could expect, and we should try to use our highways with a little more care."

L'HOMMEDIEU BILL AS NOW SUGGESTED.

ALBANY, N. Y., April 23.—Last week passed and the Committee on Rules of the Assembly did not take up the L'Hommedieu auto-tax bill for amendment, as has been requested, by substituting the registration fee plan—which Senator L'Hommedieu should have placed in the bill before it passed the Senate—for the tax provisions. All through the bill the word "tax" is stricken out and the word "fee" substituted. The chief feature of the change in form is contained in the first amended section of the law and the title, wherein it is stated that the act shall be one to amend the motor-vehicle law by "prescribing a fee for the annual registration of motor vehicles and providing for the collection thereof."

The changed wording goes on to state that: "There shall be paid annually on or before the first Tuesday in July of each year, by the record owner of each motor vehicle so registered, except motor vehicles owned or kept by manufacturers thereof or dealers therein for purposes of sale or other business purposes, a registration fee of \$1 for the first 500 pounds in weight of such vehicle, and \$1 for each additional 500 pounds or major part thereof. The annual registration fee hereby prescribed shall not be required to be paid by the owners of motor vehicles constructed, owned, and used for the transportation of goods, wares, or merchandise, nor of any motor vehicle regularly let for hire and which is operated wholly within the limits of a city."

"Nothing herein contained shall be construed to require the owner of a motor vehicle, who has registered his machine under the provisions of Chapter 538 of the Laws of 1904, to reregister the same to comply with this act. For the purpose of computing the annual registration fee of a motor vehicle heretofore registered, the weight of such vehicle shall be taken to be 2,500 pounds, unless prior to the first day of July, 1906, the owner thereof shall certify its weight in writing to the secretary of state, in which the weight so certified shall be taken as the basis for computation of such annual registration fee."

In sub-division 6 of Section 2 of the present motor vehicle law, the fee for duplicate seals for manufacturers and dealers is changed from fifty to twenty-five cents.

The new reciprocity clause is placed in sub-division 9 of Section 2, which now exempts the non-resident owners of motor vehicles who have complied with the motor vehicle laws of their home States by adding the following: "Provided that the laws of the State, Territory, or federal district of their residence shall permit motor vehicles which have been registered as provided by this act, to be used and operated in such State, Territory, or federal district without further license or restriction."

The chauffeur misdemeanor clause is a new sub-division reading: "A chauffeur or other person who shall operate or use a motor vehicle without the consent of its owner, is guilty of a misdemeanor, and upon conviction he shall be punished by a fine of not exceeding \$100 or by imprisonment for not more than six months, or by both such fine or imprisonment."

The other changes in the L'Hommedieu bill, while so extensive as to leave little of its verbiage, are of a verbal character necessary to alter it from an unconstitutional tax law to a registration fee statute.

There should be no difficulty in getting the bill through if the advocates of it persist in keeping the members of the Committee on Rules advised of the fact that the bill is desired in the amended form and no other. But it should not be permitted to lie dormant or neglected till the last few days of the session, which is now rapidly drawing to a close, as after amendment it cannot be passed in the Assembly until it has been in its proper printed form on the desks of the members for three days. Then it must go to the Senate and take its chances with other bills.

Adjournment Probably May 4 at Albany.

ALBANY, N. Y., April 24.—The Rules Committee has as yet done nothing toward amending the L'Hommedieu bill, and no one appears to be active in forcing the bill on the attention of the committee, and it has not even been printed in the amended form. The final adjournment will probably come May 4.

COMMERCIAL VEHICLES IN MICHIGAN.

DETROIT, MICH., April 13.—In Michigan at least there is no doubt about the status of the commercial automobile in the eyes of the law. It is identical with that of the machine that is used for pleasure only, and license and registration laws are enforced as strictly in one case as in the other.

According to act 196 passed by the Michigan Legislature of 1905, to "provide for the registration and identification of motor vehicles, the registration of chauffeurs, to regulate the use of motor vehicles, and the use of public highways by such vehicles," the term motor vehicle is construed to mean all vehicles propelled by power other than muscular power, except traction engines and such motor vehicles as may be run on tracks.

Consequently it becomes necessary for every person using an automobile for commercial purposes in Michigan to file with the Secretary of State at Lansing a statement giving his name and address, a description of his machine, with the name of the maker, factory number, style of vehicle, and motor power. The owner of the automobile is then given a certificate of registration and a metal tag with his official number, which must be attached to the rear of his machine. All this costs him \$2.

In addition to the display of the number at the rear of the vehicle "there shall be displayed upon every motor vehicle in use upon any public highway, during the period from one hour after sunset to one hour before sunrise, two lamps in the front of said motor vehicle, showing a white light visible within a reasonable distance in the direction in which said vehicle is going, also a red light in the rear of such vehicle, and visible for a reasonable distance in the reverse direction."

Yet another provision of this law which will more and more affect the owners of commercial vehicles is the restriction surrounding the chauffeur, who must file with the Secretary of State his name and address, together with a description of his machine. No chauffeur can permit anyone else to use his or her certificate.

But the law goes further and says, "No person shall operate a motor vehicle on the public highway—unless such person shall have complied in all respects with the requirements of this act."

COMMERCIAL VEHICLES NOT EXEMPT.

BOSTON, April 23.—In the opinion of the State Highway Commission, which has been charged with the administration of the Massachusetts automobile laws ever since they were put on the books, the statutes do not contemplate any distinction among automobiles in regard to the purpose for which they are used. The commission believes that it was the intention of those who framed the law to have it apply to every sort of road motor vehicle, whether employed for pleasure or for commercial purposes. The commission has, therefore, acted accordingly in its administration, and exactly the same requirements are made for commercial trucks and delivery wagons as for touring cars and runabouts.

Austin B. Fletcher, secretary of the Highway Commission, when he was questioned by a representative of THE AUTOMOBILE regarding the application of the registration and licensing law to motor vehicles used for business purposes, replied:

"There is no possible question that the law as it stands requires the registration of all motor vehicles, and the purpose for which they are employed is of no significance. The Commission has never made any distinction and has not considered any necessary. Commercial vehicles must be regularly registered and must carry numbers, lamps, gong or horn, etc., and their drivers must have licenses. On the matter of what shall be considered as coming under the operation of the law the original statute of 1903 is very explicit, and though the law has been frequently amended the section specifying the scope of the statute remains in its original form as it came from the legislature."

THE TRIP OF THE "MOUNTAINEER."

OMAHA, NEB., April 19.—Viewed by a crowd of curious all day long, the Reo *Mountaineer* has occupied a position in the show windows of the Deright Automobile Company all day, its arrival in Omaha being the signal for automobile owners to call and inspect the battered little touring car that has just completed its nine thousandth mile, and still has nearly two thousand



THE REO "MOUNTAINEER" HAS A NEBRASKA MUD BATH.

more to cover before arriving at its final destination, New York City.

The members of the newly formed Omaha Automobile Club, most of whom it has been my pleasure to meet, have all taken a lively interest in the transcontinental tour, and from the conversation I have had with several prominent automobile owners, I think it very likely that several of them will tour over part of the route taken by the Reo *Mountaineer* from Albuquerque, New Mexico, to Omaha. I have met no one that thinks he would care to drive an automobile between Albuquerque and Dagget, Cal., over that part of the United States known as the Great American desert. Frankly, I don't think I should care to tackle it again myself.

The roads from Omaha to Lincoln were in terrible shape when we came over them the early part of the week. In the hollows deep mud and sometimes deep water still exist, while the higher points along the road, where the ruts have become hardened, are so infernally rough that tires, axles, machinery, and, in fact, the entire automobile, are subjected to such a shaking up that almost anything is liable to happen, unless the speed is reduced to that of a farm wagon.

Talking about wear and tear on tires brings to my mind a sad incident that happened on the road to Omaha. It was nothing less than the bursting of one of our front tires, a casing and tube that had successfully withstood the hardships of the trip. This pair of front tires, one of which, badly worn and almost ready to burst, still encircles the right front wheel of the Reo *Mountaineer*, were put on at Boise, Idaho, and the long, hard service that they have withstood must be a surprise to even the Diamond Rubber Company, their makers.

In passing through the city of Fremont we stopped for gasoline, and our car was immediately surrounded by a crowd of automobile enthusiasts, some of the older members of which no doubt had heard their fathers speak of the passage of this same car through this same town many, many weeks ago.

Eight miles of good macadam pavement was encountered just before reaching Omaha, and over this our little car fairly flew with throttle wide open and spark well advanced. It certainly seemed good to run over macadam roads once more, and we arrived at the Deright Garage on Farnam street a full hour before we were expected, by so doing missing the escort from the Omaha automobilists that had been planned. A run of 100 miles over such roads as we encountered Wednesday is certainly a pretty good mileage record.

PERCY F. MEGARGEL.

UTILITY OF THE AUTOMOBILE.

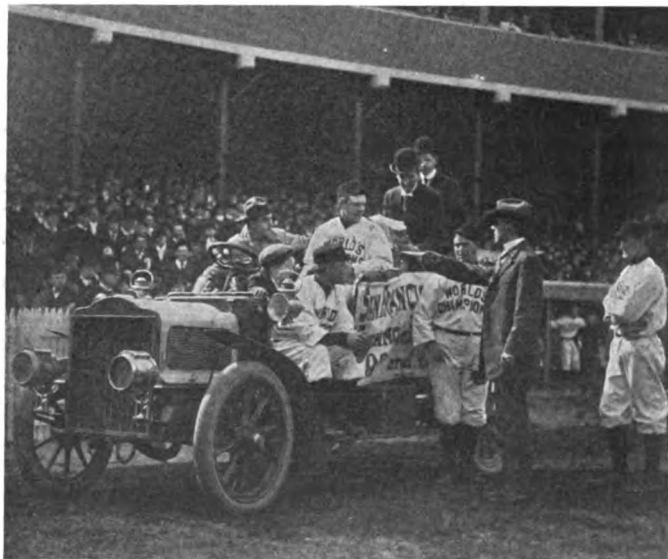
HARVARD, ILL., April 23.—E. A. Manley, a young man of this city, has demonstrated that an automobile is a most valuable adjunct to the business of a commercial traveler. Manley was a student in the city schools when his physician told him he would have to take to outdoor life or his health would be a failure. He is the son of one of the members of the firm of Manley Brothers, who are selling automobiles. Young Manley concluded to put his machine to good use, and bargained to carry the drummers around McHenry county on goods selling tours.

On one day Manley carried three drummers, each selling different lines, making nine different towns, and covering 116 miles. At another time he made eleven towns in 110 miles between 7 o'clock in the morning and 9 that evening. In the entire season he made over 8,000 miles. He used a Model F, 10-horse-power Rambler. Manley established a schedule of 10 cents a mile for one passenger, 15 cents for two, or 20 cents for three, and this tariff was used during the entire season. His gasoline and lubricating oil averaged 3-4 cents per mile.

Manley attributes a good deal of his success in keeping his chain and other machinery free of mud and dust. He contrived a large pan, 4 feet long, 3 feet wide, and about 6 inches deep. He strapped this pan so as to protect the chain from the mud thrown by the front wheels. The contrivance weighs about twenty-five pounds.

AN AUTOMOBILE RUNS THE BASES.

For the first time in the history of the Polo Grounds, last Saturday an automobile received carte blanche to travel about the famous diamond of the New York Baseball Club. This permission had been granted to further the plans of Willie Hoppe, the young billiard expert, in his efforts to raise money for the sufferers by the San Francisco disaster. Half an hour before the game began Hoppe's machine, a White steamer, was admitted to the field and was driven across the diamond to a position in front of the grandstand. Then Manager McGraw took a seat in the car and offered at auction the baseball with which he had been practising. Finally, on the "third and last call," a bid of \$200 was received from one



MANAGER MCGRAW SELLS A BASEBALL FOR \$200.

of the boxes, and the ball was knocked down at that figure. The purchaser proved to be a representative of the White Garage, in New York City, who explained that the amount had been raised by subscription from the employees of that establishment.

Then the entire team of the World's Champions climbed on the car and it was driven around the field. A strong pair of lungs shouted the purpose of the party to all of the 20,000 people who had gathered for the game, and Hoppe and his assistants walked through the stands selling evening papers at fancy prices.

HELPFUL TO THE MAN WHO DRIVES HIS CAR.

When Your Gasoline Pipe Breaks Try This.

It is a good idea to carry with you a moderate-sized length of small rubber hose for an emergency which may arise at any time owing to a sudden rupture of the gasoline feed pipe running from the supply tank to the carbureter. A common cause of leakage is due to the gasoline pipe becoming unsoldered from the cone-shaped pocket at the bottom of the tank, and when this occurs the average automobilist is liable to be towed to the nearest repair shop unless he has a soldering outfit with him and can use it to advantage after the tank has become emptied. Even then, if he has no extra gasoline with him, he will be up against it. If you carry with you the small hose mentioned above, with one end of it fitted to a short length of small pipe, together with a gallon or two-gallon can of extra gasoline, you can manage to keep the car running, provided the spout to your extra can of gasoline is fitted with a cork stopper. The loose end of the rubber hose can be stretched over the fractured end of the gasoline pipe, the other end of the hose to which the short length of extra pipe is attached can be pushed through an improvised hole made in the cork stopper of the can of extra fuel, and by propping up or holding the can you are able to supply your motor with gasoline, and reach home or a place where repairs can be made.

Some Peculiarities of the Vibrating Spark Coil.

Automobilists' troubles with vibrating coils are in many cases due to ignorance in the matter of correct adjustment, says the *Autocar* (Eng.), but in a still greater degree to bad material used in the construction of the vibrator and the system of construction. Of course there are numerous instances of trouble due to genuine breakdowns inside the coil, but they are in the minority. In effect vibrator troubles result in misfiring and loss of power, and, in the case of distributor coils, pounding in the motor. Misfiring has, in many instances, been found to be caused by stiffness of the vibrator, and for this reason at high motor speeds the duration of contact at the contact-maker is less, the current through the primary winding at that moment is less, and consequently the core pull is not strong enough to separate the platinum points. Pitting and fusing of points also seems to be a general evil, and this sometimes caused by dirt, the points bearing on the edge instead of square upon each other. German silver, silver and even pure platinum points are all subject to pitting, and quite 25 per cent. iridium platinum alloy should be used. A complicated vibrator will upset a man's nerves more than anything we know of and pains should be taken to make a study of its vagaries.

Plug Switch for Spark Testing.

A plug switch has been brought out in England to be used for cutting out ignition in one cylinder while the sparking in the others is being tested. The device clamps around the body of the plug and has a spring blade to which is attached an insulated handle. By means of this handle the blade can be sprung up into contact with the insulated terminal of the plug, thereby establishing connection between the secondary wire and the engine jacket so that the current will not pass between the sparking points. This obviates the bad practice of disconnecting the wire from the plug, which will, if persisted in, break down the insulation in the coil, as the secondary current is being induced continuously and is always seeking a means of escape. No injury will result, however, if the primary current is broken by holding down the vibrator.

Proper Way to Inflate Tires.

The only certain way of properly inflating a set of tires and of ascertaining the amount of pressure exactly is by the use of a good registering pump. The valve should first be pressed in with the pin in the cap to make sure that it does not stick. The pump piston should be raised to the top of the cylinder and pushed all the way to the bottom, giving full, steady strokes. Each time the plunger descends the gauge pointer will fluctuate more or less beyond the center of equilibrium, according to the rapidity of the stroke. To find the constant pressure, a full, slow stroke should be given, and near the end the plunger should be held stationary, equalizing the pressure in the pump and tire. The gauge pointer will then slowly find its balance and remain stationary, pointing to the figures of the real pressure in pounds. There is an impression that the rise of temperature of the air in a tire due to frictional heat often causes sufficient pressure to burst the tire. But it is asserted that this heat can hardly reach more than 140 degrees Fahrenheit, and, if a tire has been inflated with air at 68 degrees, this will increase the pressure only one-eighth.

Dash Screens for Wet Weather.

The question of the safest and best forms of dashboard screens is being discussed by the English automobile papers. Although almost any form serves to break the rush of wind and deflects the dust in dry weather, it is pointed out that in cold and rainy weather the glass is likely to become covered with moisture and prevent clear vision. It is suggested that all screens be made to fold so that the upper portion can be let out of the way when desired. Various forms of such screens are made, those most favored being so constructed as to let the upper section open inward, close to the driver, where he can easily wipe the moisture from the glass, or can be moved entirely out of the field of vision if desired. All such special constructions could be avoided, however, if the glass could be treated with a preparation that would prevent the condensation of moisture without impairing the transparency of the glass.

See that the Lubricant Goes Where It Belongs.

Oilers of all kinds should invariably be kept in first-class condition. They can be readily flushed and cleansed with kerosene, and if the kerosene flushes the bearings of machine they will also be benefited by the cleansing. Many operators, especially those of limited experience, pay too little attention to seeing that the lubrication of an automobile is properly effected. The motor and many of the working parts may be reeking externally with oil, but that indicates nothing but wasted material and labor. Conveying the lubricant to the interior bearing surfaces is the thing that counts. Any blockhead can pour oil over the outside of a machine, but it takes common sense and discernment to see that it reaches the working surfaces of the bearings.

Importance of Throwing Out the Clutch.

It is just as well to remember, upon bringing the car to a standstill, that the clutch should be thrown out, and that the operator should make sure that it is thrown out. This was not properly done in front of a Boston garage last week, and the car ran away, creating a bigger disturbance than the proverbial bull in a china shop. The owner had stopped to adjust his carbureter, but let his engine run. The car suddenly started and before it could be stopped had nearly run over its owner and several other people and smashed into another vehicle, demolishing itself generally.

HOW TO OPERATE A GASOLINE CAR.*

By EDWARD T. BIRDSALL.

GENERAL.—The operation of an automobile on a highway, if analyzed, is an exceedingly complex act. Like walking, skating, or swimming, it is really very easy after one learns, and the various movements are soon performed more or less mechanically and instinctively. Anyone not unsound mentally or deficient physically can, in a short time, learn to operate a car well enough for all ordinary purposes, but really expert driving is only acquired by study and long practice.

The expert driver will detect the slightest variation in the action or sound of the mechanism, and will thus be able to forestall a stoppage by the proverbial "stitch in time." He will so calculate his speed and position on a crowded street that he will avoid accidents or "tight places," instead of running blindly in and then trusting to luck to get out. Anyone who has ridden a bicycle or steered a small boat will learn to steer an automobile very quickly.

Starting.—We will now suppose that your new car has just arrived and that you have read the maker's instruction book, if there was one, or obtained a general idea of the car from the catalog. Let us assume that it is of the runabout or light touring car class and has a one or two-cylinder engine placed horizontally under the body, a planetary type of change gear, and is in good order. Having uncased it, examine the tires. If one is flat, see whether or not a nail of the crate was driven through it. Pump up all the tires to the proper pressure.

Fill the respective tanks with gasoline, water (if not air cooled), and lubricating oil. Put oil in the engine crankcase, change gear box, and rear axle or differential, if necessary. (This will depend upon the particular construction of your machine). Oil every joint of the axles, steering gear, change gear levers, brake gear, pedals, engine, and chain (if it has one). Do not be afraid to use plenty of oil on a new car; later on it will not need so much.

See that the battery is in place and connected.

Set the brake and turn the engine over a couple of times to ascertain if it turns freely and that the gears are out.

Flood the carbureter, retard the spark, open the throttle, and turn on the switch.

Now turn the engine over as fast as possible and it will start after a few turns. It is best and sometimes easier to turn the engine over with the compression relief cocks closed, but if the cylinders are very large and the compression high it will be necessary to open them. As soon as the engine starts, close the compression reliefs, advance the spark slightly, and close the throttle until the engine is running quite slowly, but in no danger of stopping. See that the lubricator is feeding oil properly and, if water cooled, that the water is circulating in the engine and radiator.

Running.—The car being in a place where a false move will not cause an accident, take your seat at the steering wheel and note the effect of opening the throttle and advancing the spark. Place the spark in a position of about one-third advance and open the throttle until the engine is running at about one-half speed, now release the brake and very slowly push the pedal or hand lever (as the case may be) that controls the first (low) speed. The car will slowly move forward, and, after running a short distance, throw out the gear and put on the brake. Repeat this until the steering and the starting and stopping can be done with ease and certainty. Do not put on the brake until the gear is out and do not put on the brake abruptly.

If you can get an experienced operator to accompany you on this first trip, it will add greatly to its success and materially shorten the time of learning. Carefully avoid, however, the "bright" local mechanic and the bicycle repair man; they are both anxious to learn—at your expense.

Now, while running on the first speed on a straight road free from traffic, throw out the low gear and at once push the lever until it just begins to engage the second (high) speed, and, as the car picks up speed, push the gear all the way in. Changing speeds is always the hardest thing for the novice to learn to do well. If the engine is running too slowly when changing from low to high, the engine will stop. If the engine is running fast and the change is made too quickly, then the car will jump forward with a great jerk and there is danger of breaking a chain or a gear. All changes of gear should be made slowly, so as not to bring heavy strains on the machinery. While operating the change gear lever with the right hand, do not move the steering wheel with the left, thus causing the car to wobble all over the road. When going from a low gear to a higher one, do not allow the car to lose much speed between the changes; in fact, it is a good plan to speed up on the lower gear just before changing.

The novice will find when learning to steer that he will at first always turn the wheel further than necessary so that his path will be a series of zigzags. After a straight course can be steered, the gears changed and ordinary turns made, backing and turning around should be practised. For this practice select a road free from deep ditches, trees, and poles, or a large lawn or open space. Considerable practice is necessary before short turns on narrow roads bordered by deep ditches should be attempted.

Slide Gears.—A car of the heavy touring car type or any car having a slide gear type of change speed gear is operated as above with the exception of the speed changing. In this type the flywheel clutch must be disengaged by depressing the clutch pedal every time the gears are changed or the brakes applied. Many clutches of this type are "fierce" when new; that is, they take hold very suddenly even if let in very slowly. A beginner should never learn to drive with a clutch of this kind, as it will surely lead to an accident or damage to the car.

Driving in city traffic should not be attempted until you feel perfectly at home on the car and can operate the various levers with certainty. The best method of operation in traffic is to put the car on the second speed and control the speed with the throttle and clutch. In this way the car will always be able to "pick up" from almost a standstill and will also run fast enough to pass horse traffic when necessary.

If while driving in traffic you should get rattled or do not see your way clearly, *stop!* Do not try to extricate yourself by putting on speed or quick steering. Neglect to stop while there was yet time has caused many an accident and consequent repair bill.

To the experienced driver the novice always seems to change gear too late or too early. The exact moment that the gear should be changed varies with the type of car and the power, but generally speaking the gear should be changed to a lower one as soon as the engine slows down or labors from an overload, or, from a low to a higher one when the engine shows a tendency to "race" or run too fast with the load. When approaching a steep hill it is best for the novice to change early as, if he allows the engine and the car to slow down too much on the high gear, it will be found difficult to "pick up" again even on the lower gear. When forced

to slow down for traffic, change at once to a lower gear, so as to be ready to go ahead when the opportunity offers. On the other hand do not run on a low gear one second longer than is necessary. A car running along on a low gear with the engine "racing" proclaims the incompetent driver.

Changing gear on slide gear cars is more difficult than on the planetary type. The gears should be shifted without noise or shock. Going from low to high is usually easier than the reverse. In changing from high to low the speed of the car should be allowed to slow down to as near as possible what it would be when the new gear is engaged. If the gears do not mesh at once do not hold them in noisy contact, but change the speed of the car or the engine and try again.

Control.—The older types of small cars were controlled almost entirely by the position of the spark, while the larger ones, finding that the spark control gave rise to heating troubles, relied on a four-speed change gear box, the clutch, and an accelerator pedal connected to the governor. These crude methods have been superseded by the more modern and better method of controlling the speed of the car by the throttle valve.

Always drive with the spark fairly well advanced, on as high a gear as possible, and with the throttle as much closed as possible. This method will use less gasoline and oil, keep the engine and water cool, and produce less wear and noise.

If you have a very hot spark, as from a magneto, it is good practice to place the spark lever at a position of average advance, and control entirely by the throttle, only changing the position of the spark advance lever for very slow or very fast running. Air-cooled engines must be operated in this manner, otherwise they will quickly overheat.

Starting and Stopping.—Starting and stopping should be done with care, without jumps or jerks. Quick getaways with the dust flying, and stops made with the rear wheels sliding and brakes screeching, make fine "plays to the gallery," but they are expensive, and are usually indulged in only by green drivers or foreign chauffeurs lately landed. These practices rack the wheels and mechanism and tear the rubber off the tires. A dollar's worth of rubber is not a very large piece, and is soon rubbed off.

Rounding corners at high speed, apart from being dangerous, is also very hard on tires, and is not indulged in by good drivers. Careful driving can, without the slightest difficulty, double the average life of a set of tires.

Skidding or Sideslip.—The novice always hears the old driver recite many tales of hair raising skids on wet asphalt pavements, but never gives the subject serious attention until some day his car suddenly and without apparent cause reverses ends on a busy street and in close proximity to a trolley car. After that he has a wholesome dread of wet or greasy pavements and begins to take a great interest in non-slipping tires. Macadam and brick pavements are seldom slippery. Stone, asphalt, and wood are not very slippery when clean and wet, but when covered with a thin layer of greasy mud and slightly wet they are very dangerous. Wet clay country roads, especially when much crowned, are very treacherous, and it is sometimes almost impossible to keep from slipping into the ditch even at low speed.

The only real remedy for skidding is slow speed. A clever driving wrinkle (if caught on a slippery pavement and in a situation where a sideslip might be disastrous), is to get in the gutter with the wheels almost touching the curb. In this position it is quite impossible for the car to turn around. This is especially valuable if the street is on a down grade.

Special forms of tire treads and detachable devices to prevent skidding are used with considerable success, and if one has to drive much on slippery pavements the use of some form of non-skid is advised. Skidding is due without doubt to the presence of the differential gear, as cars having no differential seem to hold the road better. As the two rear

wheels never have exactly the same hold upon the ground, and as they are free to turn relatively to each other, it follows that as soon as power is applied to drive them or to retard them they will be acted upon unequally and one will tend to drive or hold back the car more than the other. This obviously produces a tendency towards a sidewise movement, and the inertia of the car does the rest.

When using any form of non-skid, remember that the clutch and brakes must be used more gently than before. Smooth tires will slip on the ground and relieve the mechanism of a too sudden application of the clutch or brakes, but non-skids will not do this, and due allowance should be made, or the gears, chains, and clutches will suffer. Some forms of metallic non-skids will slip on hard, dry asphalt if the brakes are applied when running at high speed.

Brakes.—While it is desirable that a car should always go when the owner wishes, yet it is just as necessary that it should stop when occasion requires. A car can only be driven as fast as its ability to stop will allow. It is this great ability of the automobile to stop quickly that makes it so safe. Upon starting out on a ride of any length do not fail to try your brakes. Often you will find that one set does not hold as well as it should and requires attention. Brakes should be used with moderation, except in case of emergency. Ordinary stops should be made by shutting off the power and allowing the car to coast nearly up to the point of stopping. The maximum braking effect is not, as many think, when the wheels are sliding, but it is when the wheels just do not slip. As soon as the wheels slip, the retarding effect is greatly reduced.

Hills.—Climbing and descending hills, especially if they are long and steep, calls for the exercise of considerable judgment, and requires a perfect knowledge of the car. Power for the ascent and ample braking power for the descent are prime requisites for safety and comfort. Short hills can be rushed, if the traffic will allow, but long ones are better taken from the start on the proper gear with the car well under control. When climbing a hill and the engine begins to lag, shift to a lower gear at once. Do it with deliberation, for with a slide gear, if you miss getting the gears in mesh at the first attempt, the car will in the meantime have lost its headway and started backwards unless the brakes will hold it. In this case it will be necessary to come back to first speed and start anew. Good modern brakes should hold equally well in either direction, and should not be interconnected with the clutch.

If doubt is felt as to the ability of the motor to climb the grade or the brakes to hold the car and there is a sprag on the car, it should be lowered at the foot of the hill and dragged all the way up. In the absence of a sprag, one of the party with a small log or fence rail should walk behind the car on the alert to chock the wheels if the car stops.

Descending long, steep and unknown hills is one of the most dangerous tasks that the tourist has to accomplish. Use first one brake and then the other, even if they are water cooled. The engine can also be used to retard the car by shutting off the spark and putting in a low gear.

In small cars the high speed will have to be used, as the low speed is too low. In cars having three or four speeds, the second or third will be found best. The gear, however, must be put in before the engine is stopped and before the car starts down the hill. If you are coasting down a hill with the clutch out or running down with the engine acting as a brake, and you throw out the gear on a slide gear car, it will be found to be practically impossible to get them in again until the engine is started or the car almost stopped. Therefore, at the top of the hill, put in the gear that you intend to carry to the bottom. The engine friction and the compression, on a low gear, will prevent the car from running above a fixed speed, which can be further reduced by braking.

THE MAKING OF AN AUTOMOBILE.

THE up-to-date automobile manufacturing establishment is a place where system is highly developed as being absolutely necessary to get the best results from special machine tools, automatic and otherwise, and also from the highly-skilled specialists upon whom devolves the assembling of the mechanism and other

work that cannot be done by machines. American automatic machinery, which is known throughout the world, finds many uses in automobile building, and is an exceedingly important factor in the manufacture of the moderate priced car that is so much in evidence, not only on the smoothly paved streets of cities, but everywhere on the rougher country roads, and even in the deserts and among the mountains. By the use of automatic and semi-automatic machinery parts can be made by thousands with variations in size that cannot be measured by any



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MACHINING A DIFFERENTIAL CASE.

standard larger than the thousandth part of an inch; and, accurate as the work is, it is turned out with a rapidity that would have bewildered the old-time machinist, and at a cost for labor per piece that is ridiculously low in comparison with old-fashioned and less accurate methods.

The building of a modern automobile does not consist in making the parts for each machine separately and taking them from the machine shop to the assembling floor. This was, of course, necessarily done on early cars, of which only a few were built, each having to be specially fitted with its own parts. Now cars are frequently made in hundreds, and in some cases in thousands, all exactly alike. A special machine tool makes a certain part and does nothing else in many cases. There is no stopping short of a certain specified number of parts, and the parts are transferred as fast as they are finished to a great stock-room and deposited in their special bins or compartments. In the stock-room are all the parts necessary to make up the complete car, with the excep-

tion of the body, which is made in its own special department of the works. Each part has its special designating name or number.

Suppose the cars are being made up in lots of fifty. Fifty finished cylinders, or sets of cylinders, as the case may be, fifty crankcases, fifty crankshafts, fifty sets of valves, of springs, of bolts and nuts and of all the engine parts are taken to the engine assembling department. Fifty sets of frame members, or in some cases of complete made-up frames, are taken to another department, together with springs and other parts attached to the frame; and so on. The engine, the transmission, the axles, the running gear and other units are assembled as far as possible each in its separate department, and the assembled units are finally brought together in the general assembling room, where the cars finally take shape. The motor is lifted by a trolley-hoist or similar device, run to the frame that is to carry it, and lowered into place. The transmission, if heavy, is treated in the same way; if light, it is readily lifted into place and, thanks to the accuracy of the machine work, the parts fit together accurately and easily—and any part of one car will fit equally well in the appropriate place in any other car of the same model.



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ASSEMBLING AND TESTING MOTOR IN THE SHOP.

Previous to the assembling the parts must go through a series of tests and gaugings; the assembled units, such as the engines and transmissions, must be tested to insure their being in proper working condition in every respect. And even further back, in the raw material, there is a great deal of testing done in order that time and labor shall not be wasted on material that does not come up to the requisite standard of excellence.

Perhaps the most important and interesting process of intermediate testing is the testing of the motor. Usually the motor is first placed on a stand and is run by a belt from a pulley on a line shaft. During this "limbering-up" process, as it is commonly called, the engine is kept flooded with oil, and is carefully watched for hot bearings or binding in any of the working parts—faults that can be discovered in this way better, perhaps, than when the engine is running under its own power, and with less chance of damaging the parts involved. There is rarely any reason for turning the engine back to the assemblers for refitting after the limbering-up, for the automatic machinery has done its work well, leaving a comparatively easy task for the assemblers. The motor next goes to a testing stand, where it is given its carbureter, spark plugs and other ignition apparatus, and is started and run under its own power, slowly at first, but with



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PUTTING CHASSIS TOGETHER ON ASSEMBLING FRAME.



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LOWERING TESTING BODY ON THE CHASSIS.

gradually increasing speed until the maximum is reached and the engine has been found safe to run at a speed higher than any driver of intelligence will think of running it.

After this comes the test for power. The methods of ascertaining the power developed vary; sometimes a prony brake is used, sometimes a dynamo, and sometimes, though not often, a screw propeller working in a tank of water. Whatever test is adopted, however, a certain standard is set, and the motor must come up to this mark or go back to the assemblers, who will have to find the reason for the lack of power and remedy the trouble.

After all parts are finally tested and assembled into a complete chassis—that is, the car with every part except the body—a rough body, consisting practically of a mere seat for the driver, is put on and the road testing men put the car through a regular set of trials for speed, hill-climbing and reliability. Skilled adjusters set each valve, each adjusting screw, and see that every part of the car is properly set to do its best under average conditions, and the car is then sent back to the shop for its final painting and finishing and for its body and its own tires, if these are put on at the shop. Then, shining with new paint, polished brasswork and fresh upholstery, the machine goes to the storehouse, ready for shipment, and bearing no indication of the road tests, sometimes anything but gentle, that have been carried out to prepare the machine in its entirety for its as yet unknown owner.



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ALL READY FOR THE PRELIMINARY ROAD TEST.**KNOW THY MOTOR GOOD ADVICE.**

The old Greek motto, "Know thyself," the modern horseman translates "Know thy horse," and the owner of an automobile must make it "Know thy motor." And all these things are akin, for in learning all about anything with which we are intimately associated, whether human, animal, or mechanical, we are apt to learn a good deal about ourselves. So states the *Auto-Crat*, devoted to American Mercedes interests.

The motorist should know his machine as the rider knows his horse, which is to say as the brain-worker knows his own intellectual capacity and the laborer his own thews and sinews. To let another person do your motoring for you without care or concern is very nearly as ridiculous as to let somebody else do your thinking or walking for you. An Oriental prince once went, as a matter of sightseeing, to an English ball. It was his first experience of the kind, and he did not attempt to dance. He looked on for a while, and then turned to his host with the contemptuous observation, "What foolish people these English are to take so much trouble! In my country we have other people to do our dancing."

There are a good many people who have taken the Oriental attitude toward their motor cars. They did not want to take the trouble to learn anything about them—why should they when they could get other people to attend to the matter? Consequently, they are not only at the mercy of any incompetent chauffeur they might be so unfortunate as to get, but they are unable to go anywhere in the car when they happen to be without a chauffeur, and they miss the delight of long solitary drives, through the silent woods or beside the sea, alone with Nature and their own thoughts; or that even more delightful solitude *à deux* in which no man wants a third person's ears cocked for whatever it may be his mood to say. Of course the chauffeur is supposed to be discreet, and usually he is—it is part of his business—but, after all, there are times when one would rather not have any outsiders about.

In fact, it may be said that the only way to get anything like full value out of a motor car is to understand it. The thing is not so very difficult, either—not half so hard as the problems most people have solved in their school days, when they studied algebra and physics. And there is a fascination in learning all about one's own possession, be it a motor or a baby.

The man who owns an American Mercedes, and learns to know it thoroughly, will wonder how he ever dreamed of anything so banal as letting other people take the entire care of it and incidentally get most of the fun out of it, for half the pleasure of owning a motor is to feel the marvelous thing obey your hand and serve your mood.

The true motorist, the man who took to the sport like a duck to water when he first knew about it, has, of course, understood this all along. He has always felt the importance of giving his precious possession the scientific care which comes only of personal knowledge. He does not, of course, personally attend to the cleaning and repairing and driving of the machine on every occasion any more than the good horseman rubs down or shoes his horse, but he knows how it ought to be done, and he knows when it is not done well, and why things are unsatisfactory when they are. He does not have to depend on other people to train his chauffeur for him. He can, at a pinch, take the raw material and turn out the finished product; and there are some green chauffeurs who only need a little intelligent direction to be jewels of their kind.

So, if you would get the best work out of your motor, get into touch with it. Learn to know not only how to evoke the commonplace and easily gained moods of the motor, but how to awaken every power of its hidden life; how to lead it to answer and obey your own moods; how to conserve its energy and your own, so that you may take the longest journeys, the most severe tests of speed and endurance, with the absolute ease and confidence which a good rider feels when he rides to the meet on his own favorite thoroughbred. That is the way to enter into the real enchantment of motorland.

HOW THE A. C. A. TWO-GALLON TEST WILL BE RUN.

A COMPETITION of practical value, as well as interest, to automobilists will be the two-gallon efficiency test of the Automobile Club of America, which will be held in New York City, Saturday, May 5. Briefly, the object of the contest is to ascertain how far a car can be run on two gallons of gasoline; all the machines entered will start from the same point and follow the same route. The start will be made from a garage near the A. C. A. clubrooms, 753 Fifth avenue, and the route will be up Fifth avenue to One Hundred and Tenth street, west to St. Nicholas avenue, up St. Nicholas avenue and eighth avenue to Central Bridge, which carries One Hundred and Fifty-fifth street across the Harlem river, and then on out Jerome avenue to Pelham Parkway, the Shore Road, New Rochelle and the Boston Post Road.

For those who can take their attention from the economical operation of the car, the route will be an interesting and picturesque one, and the roads are good. Competing cars must be stock machines. The prizes will be worth compet-

The committee reserves the right to reject any car with or without publicly stating the reason; but in the latter case the entry fee will be refunded.

II.—Cars Eligible to Compete.

The contest will be limited to self-propelled pleasure vehicles of individual owners, or of manufacturers, taken from stock.

Special or freak cars will be excluded.

Except for the introduction of any devices regularly sold, no alteration of the mechanism, gears, carbureter, tank, or any other part will be permitted, permissible manipulation being limited to such adjustments of ignition, mixture, etc., as are ordinarily made when on the road.

Each car must be provided with a proper muffler, which must be kept closed, and it must have a differential gear or its equivalent.

Any car which in the judgment of the committee makes an excessive amount of noise or smoke will be excluded, but in this case the entrance fee will be refunded.

III.—Entries.

The entrance fee will be \$10 per car, and the entries will close on May 2 at noon.



PRIZES TO BE CONTESTED FOR IN THE AUTOMOBILE CLUB OF AMERICA'S TWO-GALLON EFFICIENCY TEST.

ing for. First prize will be a punch bowl valued at \$500; a cup valued at \$100 will go to the second car; and third will receive a medal. The prizes will be on exhibition at the clubrooms until awarded.

The rules governing the contest are very clear and explicit, and Rule IX, covering the handicapping system, is particularly interesting, being the solution of a difficult problem as worked out by the special committee governing the contest. The committee consists of Schuyler Skaats Wheeler, chairman; George F. Chamberlin and Charles G. Curtis. Following are the rules:

I.—General.

It will be assumed that every contestant is acquainted with the rules of the contest. By entering therein he shall agree to abide by the rules.

In the event of any dispute concerning the interpretation of the rules, the decision of the committee shall be final.

Except in regard to the score formula, the committee reserves the right to alter or amend the rules up to the time of starting as it may deem it expedient for the better management of the contest.

No entry will be accepted unless all the information called for by the entry blank is given therein, and it is accompanied by the entrance fee.

Entry blanks will be forwarded by the club secretary upon request.

IV.—Starting.

The contest will start from a garage near the clubhouse. Beginning at 1 o'clock in the afternoon, after being weighed in at their own convenience, the cars will start immediately, pass the club house and go over the measured course, a map of which, with the distances plainly marked, will be given to each driver. The course is straight up Fifth avenue to One Hundred and Tenth street, to St. Nicholas avenue, to One Hundred and Fifty-fifth street, to Central Bridge, to Jerome avenue, to Pelham Parkway, to the Shore Road, to New Rochelle, and on to Boston Post Road, per route card.

No attention will be paid to the time made, but any car not starting within fifteen minutes after the committee gives the word to it, or that does not finish within five hours, will be disqualified.

Before starting, each car, and especially the float chamber of its carbureter, must be emptied of all gasoline down to the point where its engine will stop. A sufficient number of independent experts will be on hand to examine the cars at this time, and in any case where it appears to the committee that any attempt has been made

to avoid compliance with the rules, the car will be excluded from the competition. A sufficient number of cans, each containing exactly two gallons of gasoline, carefully measured and sealed, will be at hand and will be distributed to the cars.

V.—Legal Requirements.

Each car will be required to carry its state registration numbers and all equipment required by law, such as brakes, lamps and horn.

VI.—Observers, Maps and Numbers.

The committee will select and assign an observer to each car and will be given a contest number and map of the route, showing distances, and a memorandum of weight.

VII.—Weighing.

The weight of the car with its full complement of passengers will be taken as it starts in the contest and will be recorded upon the report sheet for use in rating the car. The full complement of passengers will be as many as the car is constructed to seat comfortably.

VIII.—Passengers.

The load carried by each car will consist of passengers only, including the operator and observer. No dead load other than ordinary equipment will be permitted.

All passengers and equipment in the car at the time of weighing must remain during the entire run.

IX.—Score Formula.

The rating is based on cars having four or more cylinders. Cars having two cylinders will be rated as though they weighed, loaded, 75 per cent. of their actual weight. Cars having one cylinder will be rated as though they weighed, loaded, 70 per cent. of their actual weight.

The scores made in this contest will be arrived at as follows:

To the actual weight of the car with passengers as weighed at the moment of starting (or 75 per cent. or 70 per cent. of the same as mentioned above) a handicap of 800 pounds will be added. This sum will be multiplied by the distance in miles traveled to obtain the score.

The cars making the highest and the second and third highest scores will receive the first, second and third prizes respectively.

X.—Distance Traveled.

Immediately upon a car coming to the end of its run, owing to the consumption of its two-gallon supply, the observer will determine and note the exact position at which the car stopped and the distance traveled measured from the tires of the front wheels, and will see that the car remains stationary until the "advance" or "rear wagon" reaches the point and checks the position determined by the observer. If the car has traveled over thirty (30) miles the observer will call up the club house (telephone No 2956 Plaza) and report the result, in order to facilitate the prompt deciding of the contest, and will in person immediately bring in the record which he will swear to before a notary public at the club house and deliver to the committee.

No means of propulsion for a car other than its own motor will be allowed.

At the conclusion of its run and as soon as its position and distance have been determined and it has received the relief supply of gasoline, each car will return at once to the club house. As soon as the three cars apparently having the highest scores have been ascertained, they will be sent to the garage in charge of an official and there be subjected to a further examination. The committee reserves the right to open and examine their gasoline tanks.

XI.—Protests.

Any contestant desiring to enter a protest must submit the same in writing immediately upon the conclusion of the contest, together with a deposit of twenty-five (\$25.00) dollars, which sum will be retained by the committee if the protest is not sustained. Any protest thus regularly made will be considered by the committee immediately and a decision will be rendered thereon at once.

XII.—Drivers.

No change of operators will be permitted after the start is made.

The driver of each car must operate his car without assistance from others. The observer will occupy the front seat beside the driver.

XIII.—Relief Cans.

A car serving as an "advance wagon" will accompany the first starter and will keep up with any car that takes the lead. When the leading car stalls, the "advance wagon" will note its position and distance traveled, take up its contest number and deliver to it

a five-gallon or relief can of gasoline to enable it to return to the club house. The "advance wagon" will then retrace its course, relieving in succession the stalled cars as it meets them. It will carry also a surveyor's assistant. A "rear wagon," similarly equipped and having a cyclometer, will accompany the last starter and will act in a similar capacity working from the rear of the course.

XIV.—Prizes.

Prizes, consisting of a \$500 punch bowl for first, a \$100 cup for second, and a medal for third are offered by the club, and are now on exhibition at the clubrooms, where they will remain until the awards are made.

The distances traveled, weights and ratings as laid down above will be put together immediately by the committee, who will remain in session continuously from the time the contest begins until the conclusions are reached, and the winners will be announced and the prizes awarded and delivered before adjournment.

A score board will be made up at the club house showing the number, weight handicaps, total weight, distance traveled and the score of each car, from which the prizes will be awarded.

XV.—Certificates of Performance.

Upon request, certificates of performance will be given for each car that enters, goes over the course and complies with all the rules and is therefore eligible for a prize.

Rule II has been amended to the extent of permitting changes in the size and inclination or elevation of the gasoline tank necessary to insure the delivery of the entire two gallons to the carbureter. Entry blanks call for full details of the car, whether the driver is a professional chauffeur, a dealer or an amateur, and other information.

Among those who have expressed the intention of driving their own cars in the contest are Col. A. B. Hinton, A. R. Shattuck, John B. Trevor, Frank Eveland, Gen. George Moore Smith, A. Ward Chamberlin, Alan R. Hawley, Winthrop E. Scarritt, E. B. Gallaher and Cortlandt F. Bishop. Entry blanks will be forwarded on request by Secretary S. M. Butler, of the A. C. A., 753 Fifth avenue, New York. The entry lists will close at noon, May 2.

A WORD FOR THE AUTOMOBILE

Henry Norman is one who has been a close observer and participant in automobiling, and this well-known member of the British Parliament voices these ideas in the *Fortnightly Review*:

"Every improvement in locomotion has caused both discomfort and danger. It is probable that the users of sledges viewed with indignation the advent of wheeled vehicles. Old prints show that the fast coaches scattered flocks and herds and left postchaises in the ditches behind them. The railway was regarded for some time as an outrageous nuisance. It will be within the recollection of us all that for years bicyclists were detested, denounced and persecuted, and that every horse shied at every bicycle. In all these cases the public has had to grow accustomed to new conditions of traffic. So it is and will be with the automobile. To-day, in the minds of the unthinking, it is an offensive innovation; in a few years it will be regarded as an invaluable and indispensable condition of social and industrial life. The pedestrian will have to learn to look before he crosses the road, and that this proper place, as a rule, is not the middle of the road but the sidewalk. And it is permissible to hope that greater devotion to the public welfare will in the future provide the children of the poor with other playgrounds than the public highways. Not long hence it will seem a condition of barbarism that horses should have been misused as they are in the omnibus and the night cab of to-day, and that they should have been allowed to deposit thousands of tons of offensive manure in the streets of the metropolis every day, causing an unfailling supply of septic dust to be breathed by millions of people.

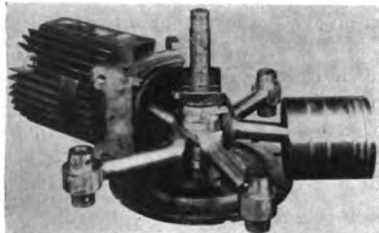
"Meanwhile, a certain amount of public discomfort and danger is unavoidable; it is one of the conditions of progress. To attempt to hinder this progress because of this temporary discomfort and danger would be—to quote a proverb of the people to whom we look with so much admiration just now, the Japanese—to 'mend the horn and kill the ox.'"

AN AIR-COOLED REVOLVING MOTOR.

Eight years ago the Adams Company, of Dubuque, Ia., started experimenting with a revolving, air-cooled type of motor and built one with three cylinders, which revolved around a vertical stationary crankshaft. During the years following, several others were built on the same principle, but increasing in size. This motor has been previously described, and mention is here made

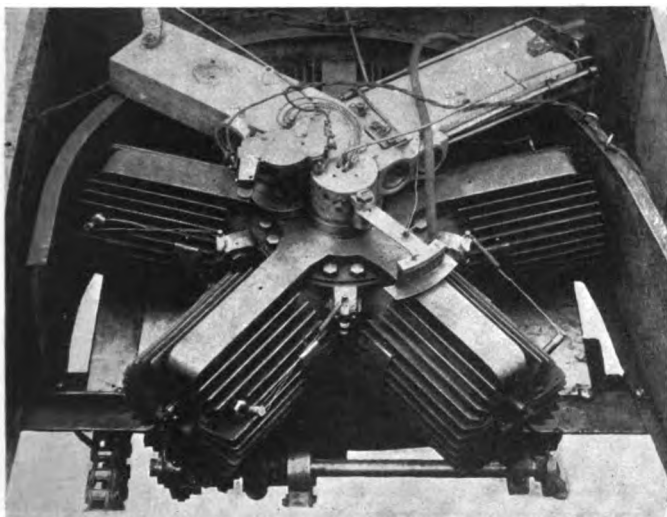
only as introductory to the description of the five-cylinder motor in the 1906 production.

Among the advantages claimed are the efficient air cooling, the saving of nearly one-half of the motor weight without sacrificing strength, closing the valves by centrifugal force, and lubrication of the cylinders their entire length. Another claim is that in the five-cylinder type, shown in the illustrations, there is entire absence of vibration under all speeds, as a power stroke is always in force, and there is no dead center to be overcome by momentum, it minimizing any tendency to jerky motion and rendering slow motor speeds possible.



CRANKSHAFT AND CONNECTING RODS.

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VIEW OF MOTOR IN ITS POSITION IN CAR.

The power plant of the 1906 type is placed slightly forward of the rear axle, which enables the use of short chains, and for the purpose of saving weight in not using shaft drive. The motor is well above the axle, the sprocket being placed on the side instead of the center to give the car a greater clearance. It will be noticed from the form of the motor that the cylinders, pistons,

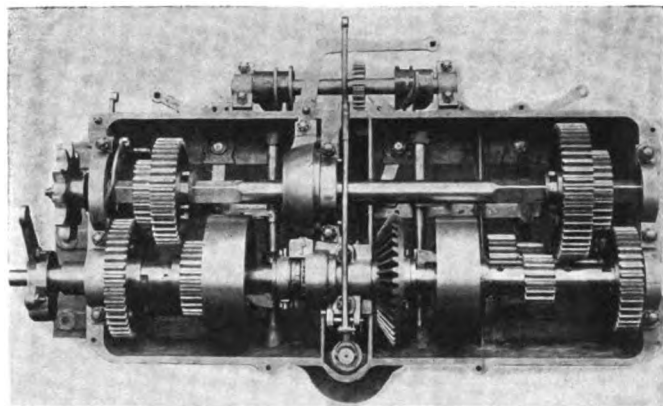
connecting rods, valves, etc., revolve around the crankshaft, a reversal of the ordinary practice. Each cylinder is complete and cast in one piece. Five of these are machined so as to fit together perfectly and are bolted together and to a cast steel bottom flange and bronze top flange.



MOTOR AS SEEN FROM BELOW.

Each piston is fitted with five rings and is connected to single steel wrist pin of large size by steel connecting rods, having bronze bushing in the piston. The speed of the motor is designed to be controlled by the variable compression

stroke which compresses and explodes only the amount of charge needed for the work. The valves are operated by cams at the center of the motor. When maximum power is needed the suction valves close at the end of the suction stroke, allowing the piston to compress the full charge on its return or the compression



BOTTOM VIEW OF TRANSMISSION GEAR.

stroke. When less power is required, the suction valves are held open for a part of this compression stroke, allowing part of the charge to return whence it came and be taken up by the next cylinder and the balance of the charge compressed and exploded. No muffler is employed. Auxiliary exhaust ports, uncovered by pistons, let out the high terminal pressure against baffle plates placed to deaden the sound of the escaping gases.

The motor is automatically oiled by a positive pump located above it. The spark is also regulated automatically by a timer as the speed of the motor accelerates, the automatic governor advancing the spark in proportion to the advancing speed. One spark coil is used. The carburetor is located just to the right above the motor, in the casting supporting the upper end of the crankshaft. A gasoline well is connected to the gasoline tank, which allows a constant level for the carburetor service. The motor is cooled by the rapid currents of air caused by centrifugal force as the motor revolves.

The transmission is of the sliding gear type, four speeds forward and reverse, and has two separate clutches, giving two independent transmissions. The upper part of the transmission case, a bronze casting, forms the base of the motor. No working parts whatever extend below the axle.

The car itself is designed on popular touring car lines, with rear seat 50 inches wide. It is finely finished and upholstered, and sells, with five-cylinder 40-45-horsepower motor, for \$3,000.



ADAMS-FARWELL MODEL 7-A TOURING CAR.

MORE TWO-CYCLE DISCUSSION.

By C. P. MALCOLM.

It is seldom that I reply to any criticism of my technical or general writings except to explain some point that appears to be obscure to some who are seeking information.

Less than six years ago I described in a popular mechanical periodical what I considered to be some important improvements in detail of two-cycle construction, and finished by saying that the speed of greatest efficiency of a 4 by 4 engine built on these lines was from 800 to 1,200 r. p. m., that at 1,600 r. p. m. it did not give one-fourth more power than at 1,200, and at 400 r. p. m. it fell considerably short of half power that it gave at 800 r. p. m.

If I had thrown a stone with great force into a wasp's nest on a hot summer day I would scarcely have made things more lively from the four-cycle cranks. I suppose I received a half bushel of letters from all over the country, howling about the absurdity of a two-cycle motor running at any such speed.

The trouble with Mr. Scott [Letter No. 328, printed April 5 on page 609] appears to be that he is wedded to the three-port constructions, and anyone who dares to point out any disadvantage in that particular feature can be depended upon to write everything else misleading.

In reference to the velocity of the charge through the transfer passage, I think that I made out the same case a little clearer than he does, if he had read it without prejudice. It is self-evident, and I took it for granted that all knew, that with the engine running very slow, as in turning it over by hand, as soon as the inlet to the cylinder opens, the air compressed in the crankcase enters into the cylinder, after which there will be some movement from the piston displacement until the piston passed the center, after which the piston displacement will suck back from the cylinder into the crank chamber, until the piston closes the inlet to the cylinder.

What I was trying to show was that at reasonably high speed no such action takes place, as the air compressed in the crank chamber will not have quite all passed into the cylinder, but will still be moving into the cylinder under, perhaps, only a few ounces pressure, but with sufficient velocity so that inertia will check the tendency to flow back from the cylinder to fill the vacuum in the crankcase, caused by the piston beginning its suction stroke before the inlet to the cylinder closes. Especially is this true if this vacuum can be filled from the carbureter, as it can and will be if a light aluminum check valve is used to control the inlet to the crank chamber.

It may be, as Mr. Scott leads us to infer, that this back flow does occur in the three-port engine. I have never tested a three-port engine to find out for a certainty, but from the complete absence of such back flow even at very slow speed, when using a light check valve, gave me the impression that even with a three-port engine there would be no back flow when the engine was running at reasonably fast speed.

There is an action set up by the exhaust, if taken care of, that materially assists in checking this back flow, that I did not allude to in my paper. This, however, will be given a little place in my next article, which will treat of the more recent improvements in two-cycle construction and the various lines along which gas engine designers are working to obtain a purer charge for the two-cycle engine. After weighing the disadvantages of each, I prefer a well-made check to a three-port.

In reference to the amount of compression in the crankcase, Mr. Scott says that, after fitting a block on the crank, the pressure gauge showed 7 pounds at 200 r. p. m., 8 pounds at 250 r. p. m., and 8 1-2 pounds at 350 r. p. m., and infers that at high speed he would get much more.

Not long since I was engaged in a series of experiments to determine the best and most practical method of constructing piston rings for gas engines. The pistons were fitted all for one cylinder, and to test the efficiency of each piston we set the combustion chamber end of the cylinder on the floor, removed the spark plug first, to see that the piston would drop freely into the cylinder from its own weight, then removed the piston,

replaced the spark plug and inserted the piston with the cylinder full of air, put weight enough upon the piston to make 5 pounds pressure to the square inch and noted the time that it would take for each piston to go down a definite distance. We found that we could make a piston that would stand from 5:30 o'clock at night until 7:30 A. M. (fourteen hours) without leaking out more than half of the air in the cylinder; yet with the spark plug out these pistons would drop to the bottom as freely as if there was no friction between them and the cylinders.

Now, there must be something radically wrong with Mr. Scott's engine or his deductions.

At 200 r. p. m., the time of leakage is .15 of one second; at 350 r. p. m., it is about .086, a difference of about .064, or, in round numbers, less than .07 of a second. Yet this small space of time permits a leakage of air, charged with gasoline, of 2 1-2 pounds out of a total of 8 1-2 pounds, or 5-17, which is considerably more than one-fourth of the entire charge compressed in the crankcase. If Mr. Scott is not wrong in his figures or his deductions, it is no wonder that the two-cycle is charged with being very wasteful of gasoline.

But this is evidently a case where ocular demonstration—the most convincing of all proofs—proves to be a delusion. I have no doubt but Mr. Scott read the pressure gauge correctly, and that if he had run his engine up to 2,000 r. p. m. he might have gotten perhaps 15 or 20 pounds pressure by the gauge, as he leads us to infer. If he could get such compression it would be a detriment to his engine, because it takes power to compress, and in the case of crank chamber compression we get none of it back as we do in cylinder compression, and in three-port engines the power is lost twice—once in suction, next in compression.

It is very difficult to get an indicator delicate enough to measure the pressure with any degree of accuracy in gas engines at very high speeds, and when you get above 1,500 r. p. m. considerable allowance has to be made for the momentum carrying the pointer beyond the actual pressure. In an ordinary pressure gauge the momentum would carry the hand pointing to the index considerably beyond the actual pressure, even at 200 r. p. m. The only way that I know of determining the pressure by an ordinary gauge would be by turning the engine slowly, say 60 r. p. m. If the engine is well made, it will not leak enough in half of a second (the time of one stroke at 60 r. p. m.) to materially alter the result, nor will the momentum of the pointer at that motion carry it much beyond the actual pressure; probably one would about balance the other.

Mr. Scott is groping hopelessly in the dark in regard to ignition. The time of contact in order to get the hottest spark depends upon the construction of the spark coil; coils can be made that will attain their maximum intensity, or complete magnetic saturation, in less than one-two hundredth part of a second, while they can be made that will take twenty times as long to do so. If running with a dry cell battery, contact any longer than complete saturation is not only wasteful of battery power, but actually produces a less intense spark.

It is generally considered good practice not to continue contact longer than half of the time necessary to attain complete saturation; you will then get about three-fourths of the maximum spark intensity at half the cost of full saturation. It magnetizes at greatest speed at first contact and retards slowly at first, but very slow during the last quarter of the time, so it is better to cut the time in half and put on battery sufficient to get the spark intensity required.

Modern jump spark coils working with a vibrator are made so that the vibrator breaks contact at the right time to get the greatest intensity of spark with the least expenditure of current. If you use dry cells for ignition, I usually recommend the use of one or two more cells than would be necessary for a four-cycle. Whether you use a primary or jump spark, a dynamo or storage cells usually furnish sufficient current to ignite either a two- or a four-cycle engine, and as they furnish a constant current a primary spark does not weaken by too long a contact as it does with dry cells, but, of course, the current is wasted in other respects just the same.

LATEST RAILWAY MOTOR CAR.

OMAHA, NEB., April 21.—The seventh motor car built by the Union Pacific Railroad Company under the supervision of W. R. McKeen, Jr., superintendent of motive power and machinery, has just come out of the shops at Omaha. It has a number of improvements over the previous motor cars, the most important being special facilities for climbing grades. Besides this, the car has the entrance in the center instead of at the rear, and the windows are round, similar to the port holes of ships, and are air, water and dust proof. Official trials developed excellent hill climbing ability, and a speed of 40 miles an hour was made over steep grades with ease. It was found that the vibration and noise of the engine had been practically eliminated, and the ventilation system worked perfectly. The railroad officers believe the car is the nearest to perfection of any turned out. It is made of steel throughout and in essentials follows the construction described in a recent issue of *THE AUTOMOBILE*.

Experiments with the motor cars have reached a stage warranting an announcement by President E. H. Harriman, of the Union Pacific, that large shops will be constructed for their manufacture. It is not improbable that these shops, which will be maintained apart from the railway, will be established in Omaha. The Commercial Club now is negotiating with President Harriman for definite assurances of this character. Several sites are under contemplation and railway lines have been surveyed to at least one.

The Union Pacific is using the motor cars with good results on branch lines and for suburban traffic. They have been confined to passenger usage as yet, but there is no doubt but that their employment will extend to the carrying of milk, cream, produce and other light products of the farms and truck gardens. Cheapness in operation, ease of service and speed are factors counting heavily in favor of the motor cars.

The Canadian Pacific Railway also has under construction at its shops at Angus, Canada, a new motor car for the Montreal-Vaudreuil suburban service. The car is rapidly approaching completion and will make its trial run within the next two weeks. This is the first experiment of its kind across the border, and there is considerable interest in railway circles attached to the coming test.

Experiments with railway motor car construction are being extensively indulged in by many of the railway systems, especially those of the western part of the country. Within the next few years a rapid development in this form of equipment may be expected which may amount to a practical revolution of existing conditions in railway operation. Each phase of development certainly shows marked advance over previous models, as in the car above described. The eastern railways are also alive to the possibilities of the motor car, but have not as yet devoted as much time to its perfection as the westerners.

TO THE SHENANDOAH VALLEY.

Many automobilists desire to tour to and through Virginia, but are deterred by the impression that the route from New York City southward is one full of difficulties. J. Frank Eddy, a former New Yorker, supplies the following information for *THE AUTOMOBILE* readers:

"Of course, the automobilist can travel from New York to Philadelphia without any trouble whatever. Though I have not been over the route from Philadelphia to Hagerstown, Md., in an automobile, I found fair roads on this section several years ago, while making a bicycle trip from New York to Winchester.

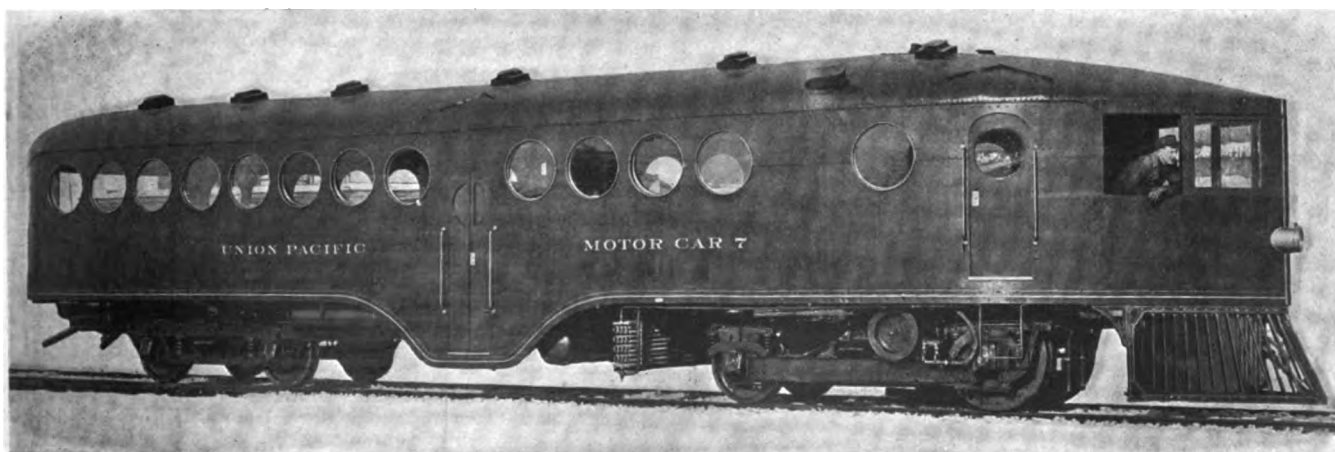
Starting at Hagerstown there is a continuous straightaway stretch of pike of the finest character extending through Winchester, forty-two miles from Hagerstown, and concluding at Staunton, a total distance of 138 miles of ideal touring. The country is rolling, and there is not a hill that an Olds runabout cannot take at high speed. On both sides of the road the Blue Ridge mountains are visible, and fertile fields and fruit orchards add to the picture, with numerous little villages scattered along the way.

"In Virginia we have a law allowing the turnpike companies to charge tolls on automobiles at the rate of five cents per mile for a round trip. This is a little steep, though the roads are well worth it, for there isn't a bad spot to be found. Not a few of the turnpike companies take advantage of this privilege to charge.

"I believe that if the Northern tourists knew of the roads and the general conditions from Harrisburg south, via Carlisle, Chambersburg, Greencastle, Hagerstown, Md., Martinsburg, W. Va., through Winchester, Va., and on down through the Shenandoah Valley, more would plan to take this trip. The celebrated Luray Caverns are situated off the main pike about midway between Winchester and Staunton and make a pleasant and very inexpensive side trip for a day. The distance from the main pike is about twelve miles, though the road is a rough country road but easily negotiated with any automobile, large or small.

"Winchester is well known far and near as a famous historic spot, the scene of many noted battles in Revolutionary times and later during the Civil strife. Nearly every field for several miles around Winchester, and up the valley, is a landmark of some battle mentioned in history."

It will be seen from the above that the field for Southern touring is not such a stupendous proposition as it has been customary to believe. Hundreds of automobilists in the North have been deterred from making Southern trips through an imperfect knowledge of conditions. The sentiment for highway improvement, especially in the coast States, is very much alive, and a continuous improved road from Washington to Jacksonville, Fla., is not too much to expect in the reasonably near future. The movement is already under way for a road from the last-named city to Savannah, and once enthusiasm is aroused connecting links will soon be projected and carried to completion.



NEW TYPE OF MOTOR CAR JUST COMPLETED BY THE UNION PACIFIC RAILWAY AT OMAHA.

AUTOMOBILES A MARINE RISK.

OLYMPIA, WASH., April 21.—Upon request of J. H. Schively, Deputy State Insurance Commissioner, A. J. Falknor, Assistant Attorney-General, has handed down an opinion in which, for insurance purposes, the automobile is classed with marine. The Attorney-General can find no other class in which to place it.

The effect is very important to automobile insurance agents, as the agent who writes such insurance, according to the State law, pays a fee of \$50 and executes a bond of \$1,000, while his company also pays the State a certain percentage on all such marine insurance written. While marine insurance was primarily intended to cover loss by sea, it has been stretched to cover loss by rail or sail.

The inquiry of Deputy Insurance Commissioner Schively read as follows:

"Beg to inquire as to whether or not automobile insurance, which is written under contract with Lloyd's underwriters and which will be considered floating marine insurance, would come under the regular brokers' marine insurance act, under which we would give bond to pay regular 2 per cent. tax, etc. You will understand that there is no stock fire insurance company that writes this class of insurance, but before going ahead and advertising this line of business we wish to get within the bounds of the law."

Mr. Falknor's opinion follows:

"As I understand the law, Lloyd's Underwriters is a marine insurance company which has not complied with the insurance laws of this state, and that, under section 22 of the compilation of insurance laws of 1906, the insurance commissioner is authorized to issue licenses to marine insurance agents who write or solicit insurance for such companies. The person applying pays a fee of \$50 and executes a bond to the state in the sum of \$1,000, and your inquirer desires to know if marine insurance companies writing automobile insurance will be considered as coming under said law. The automobile appears to be a nullius in filius in our insurance laws. The idea of protecting these modern machines against accident, breakdown, explosion, fire injury by the elements or running amuck appears as yet not to have engaged the attention of the Legislature. No niche clearly appears in the insurance laws for such risks. While this modern machine is a thing of beauty, it is an inanimate object, and for that reason live stock, casualty or life insurance would not cover the risk.

"This leaves only marine insurance, and, indeed, there are many points of similarity in the risks assumed between an automobile and a ship. Both are liable to collision, fire, breakdown, explosion, injury from the elements and running amuck, and insurance that meets the risks of a floating vessel apparently covers the risks of an automobile, and until the Legislature assembles and determines in its wisdom insurance broad enough to meet the many risks that a company will incur in carrying this line of insurance, we see no objection to any marine insurance company that wishes to insure an automobile, and such company has not complied with the laws of this state, that its agents be permitted to do such insurance provided they contribute to the state as provided in section 22, supra, \$50 and execute the bond of \$1,000, and, of course, including such risks in the total premiums less losses paid upon which the 2 per cent. tax is paid."



KUBELIK DRIVING AN OLDSMOBILE IN SAN FRANCISCO.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

- April 21-28—Canada Automobile and Motor Exhibition, Arena, Montreal.
- May 14-19—New Orleans (La.) Automobile and Motor Show.
- May 24-26—Open Air Show, Empire City Track, New York Trade Association.

Tours.

- May 5...—Two-Gallon Fuel Efficiency Test, Automobile Club of America.
- May 30...—Endurance Run, Salt Lake City to Ogden, Utah. Bert Fuller, Manager, Salt Lake City.
- June 6...—Orphans' Day, Second Annual Celebration by the New York Motor Club.
- June 16-18—Three-Day Tour, Bay State Automobile Association, Boston to Rye Beach, N. H.
- June 18-23—Second Annual Economy Test, New York Motor Club.
- July 23...—Annual A. A. A. Tour for the Glidden Trophy, starting from Buffalo or Cleveland.
- Sept.....—Endurance Run, Denver to Colorado Springs, Centennial Celebration Discovery of Pike's Peak.

Race Meets and Hill Climbs.

- April 25-27—Atlantic City (N. J.) Automobile Meet.
- May.....—Richmond, Ind., 10-mile Obstacle Road Race, Wayne County Automobile Club.
- May 10...—Wilkes-Barre (Pa.) Centennial Jubilee Hill Climb.
- May 10-12—Macon, Georgia, Race Meet, Macon Automobile Club.
- May 30...—Boston Annual Meet of the Bay State Automobile Association, Readville Track.
- May 30...—Baltimore (Md.) Race Meet, Maryland Motor Exhibition Association.
- Sept. 22...—American Elimination Trials for Vanderbilt Cup Race (Long Island course probable).
- Sept.....—Colorado Springs. Two-Day Meet. Centennial Celebration Discovery of Pike's Peak.
- Oct. 6...—Vanderbilt Cup Race, American Automobile Association.

FOREIGN.

Shows.

- April 15-May 1—Marseilles (France) International Automobile Exhibition.
- April 15-May—Milan (Italy) International Exhibition.
- April 28-May 6—Geneva (Switzerland) International Exhibition.
- Oct. 5-14—Leipzig (Germany) Exhibition, Krystall Palast.
- Nov. 1-16—Berlin (Germany) Automobile Exhibition.
- Nov. 15-24—London, Olympia Motor Show.
- Nov. 23-Dec. 1—London, Stanley Show, Agricultural Hall.

Tours.

- May 6...—Targa Florio Tour (Sicily), Auto Club of Milan.
- May 12-13—International Light Touring Car Competition, Vienna to Gratz and back. Austrian Automobile Club.
- May 13-14—Tour de France. Motorcycles and voiturettes.
- May 15-16—Le Coupé d'Or and International Automobile Congress, at Milan, Italy.
- June 5-12—Herkomer Cup Touring and Speed Trials, Munich, Bavaria.
- June 11-16—Land's End to John O'Groat's. Auto Cycle Club of Great Britain.
- June 13-16—Scottish Reliability Trials.
- July 29-Aug. 15—Circuit Européen, 3,000 miles, Paris, Milan, Vienna, Berlin, Cologne, Paris.

Race Meets and Hill Climbs.

- May 27...—Motor Cycle Club of France Championships.
- June 26-27—Le Grand Prix, Sarthe Circuit, France.
- July 8...—International Cup Race for Motorcycles, Cesky Club Motocyclistu of Austria.
- July 15...—Suze-Mont Cenis Hill Climb (Italy). Automobile Club of Turin.
- Aug. 1-15—Circuit des Ardennes (Belgium).
- Aug. 15-16—Ventoux (France) Automobile Meeting.
- Aug. 14-19—Ostend (Belgium) Meet.
- Aug. 23...—Semmering Hill Climb.
- Sept. 27...—Tourist Trophy Race, Isle of Man, Auto Club of Great Britain.
- Oct. 7...—Chateau Thierry (France) Hill Climb.
- Oct. 23...—Gallion (France) Hill Climb.

THE NEWS OF THE AUTOMOBILE CLUBS.

The Automobiling Mayor of Milwaukee.

MILWAUKEE, WIS., April 23.—The Milwaukee Automobile Club has been one of the most progressive in the entire country, and its membership includes two great enthusiasts in Mayor Becker and Attorney Drought. The latter was instrumental in obtaining an automobile law that is considered one of the most liberal and fair ever passed. Floral parades, orphan day outings, race meets and club runs have been included in the doings of the local club, which has exerted a beneficial influence for the pastime and industry in general.

The most conspicuous member of the club, of course, is its president, Sherburn M. Becker, who was elected mayor April 4, on the Republican Ticket. Mr. Becker is a wealthy young man of the strenuous type, who carried on his campaign along reform lines, attacking political bosses and corporation influence in vehement terms. Mr. Becker is only thirty years of age, but despite the odds against him in point of years he successfully routed a political machine which had been in existence in Milwaukee for eight years, and his energy and up-to-date advertising have attracted attention outside of Wisconsin. One significant fact in connection with the campaign of the "Boy Mayor" was that James T. Drought, secretary of the club, headed the call for the president to become a candidate, and the list included many of the prominent members.

A formal letter from the club, signed by Vice-president Herman Fuldner and Secretary Drought has been sent to the chief of police, calling attention to reckless driving in the downtown districts, and invoking the aid of the department. The letter urges the enforcement of the twelve-mile speed limit. Chief Janssen has assured the club that he will take precautions to see that the speed limit is observed.

Winnipeg Club Election and Meet Program.

WINNIPEG, CANADA.—At the annual meeting of the Winnipeg Automobile Club, held recently, the secretary-treasurer reported that the club had twenty-seven active members during 1905 and expected a large increase this year. Three racing events had been run off last year and the club had taken an active part in entertaining distinguished visitors to the city by means of automobile rides. Officers for the coming years were elected as follows: Patron, Sir Daniel McMillan; honorary president, John Galt; president, G. C. G. Armytage; first vice-president, F. H. Phippen; second vice-president, R. M. MacLeod; secretary-treasurer, A. Emmett. Dr. Bell, manager of the Winnipeg Industrial Exhibition, attended the meeting and invited the club to arrange a race meet during the 1906 exhibition. A committee was appointed to arrange matters with Manager Bell, and a program of five events was drawn up, as follows: Two-mile race for runabouts, two-mile race for light touring cars, two-mile race for heavy touring cars, five-mile race open to owner-drivers, five-mile free-for-all. The meet will be held during the week of July 22, and the events are open to any member of a recognized club.

Worcester Club Renominates Efficient Officers.

WORCESTER, MASS., April 23.—At the April meeting of the Worcester Automobile Club, held at the clubrooms, 44 Front street, the special committee appointed to make nominations for officers to be voted for at the annual meeting in May reported as follows: For President, James P. Coghlin; vice-president, Daniel P. Gay; secretary, Frederick E. Frost; treasurer, William N. Stark; board of governors, the previously mentioned officers and George

D. Webb, Alfred Thomas, Matthew P. Whittall, Albert H. Inman, Frank L. Murdock, C. Leslie Chamberlain, Worcester, and John G. Prouty, Spencer. With the exceptions of Messrs. Murdock and Chamberlain, all of those named are holders of the respective offices for which they have been nominated.

President Coghlin and James W. Murphy were named as a special committee to inquire into the feasibility of running a hill-climbing contest on Dead Horse hill, and to take charge of the details. Alfred Thomas, James W. Murphy and Albert H. Inman were made a committee to investigate the proposition, submitted to Mayor Duggan recently by the joint standing committee on streets of the city council, to authorize a loan of \$800,000, in three yearly installments, for the improvement of the city's streets.

The new ladies' reception and dining rooms have been completed and will be occupied after an informal opening at an early date.

Chicagoans Will Move, May 1, to New Quarters.

CHICAGO, April 23.—The present home of the Chicago Automobile Club will be closed May 1, and temporary quarters will be opened in the Fisher building. Here an office will be maintained until the new clubhouse is completed. Secretary Gorham declares that club interest will not lag while it is without a house. The runs and tours committee will announce its schedule for the season in the near future, and it is probable that some races will be run off. The work on the new \$150,000 clubhouse will begin May 1, and it will be ready for occupancy by fall.

From an authoritative source in the official circles of the club comes the information that the directors have agreed to conduct the "four-state reliability automobile tour," proposed by the Chicago Automobile Trade Dealers' Association, and that the touring committee has completed a rough sketch of plans for the route. The distance will be between 800 and 1,000 miles, and contestants may be content to travel about 100 miles each day.

A long list has been prepared by the Chicago Automobile Club, which it is proposed to make public, of the chauffeurs of Chicago who are known to have received or solicited commissions from dealers in tires, oils, and sundries generally, and articles used in equipment of a garage. Club members have complained bitterly of the high prices they have had to pay for repairs and car fixtures, and a determined effort is being made by the club to get at the root of the evil, and to abolish the practice.

Obstacle Race for Indiana Celebration.

RICHMOND, IND., April 23.—One of the principal features of the Centennial week to be celebrated here next month will be an obstacle race under the auspices of the Wayne County Automobile Club. The contest will be designed to test the skill of automobile drivers, and attractive prizes will be offered to the winners. A ten-mile course will be selected and will probably lie along the national road. Along this course dummies of various sizes will be placed, the location of which will not be known to the drivers. An official scorer will accompany each driver and will know where the objects have been placed. Dummies of cats, dogs, chickens, and men will be the objects used, and an object run over will count one point against the driver. The driver who covers the course without an error will be awarded a cash prize.

President Morse Re-elected by Hartford Automobile Club.

HARTFORD, CONN., April 23.—At the annual meeting of the Hartford Automobile Club the following board of officers were elected for the ensuing year: President, J. Howard Morse; vice-president, F. C. Billings; secretary, G. B. Dustin; treasurer, R. B. Belden;

chairmen of committees—membership, L. C. Grover; runs and tours, George Beach; racing, George E. Sykes; good roads, J. M. Birmingham; amusement, A. L. Hills; rights and privileges, R. M. Goodrich. The report of the treasurer showed a balance of over \$300 on hand. A number of new members were elected.

President Wilson, of Louisville A. C., Re-elected.

LOUISVILLE, KY.—At the annual meeting of the Louisville Automobile Club, held at the Galt House, the following officers were elected for the ensuing year: President, George H. Wilson; vice-president, Dr. W. C. Pfingst; second vice-president, Thurston Ballard; secretary, Charles Chreste; treasurer, J. B. Lewman. The club is in a flourishing condition, thirty new members having been added during the year. The annual parade of the club will be held May 26.

New Country House for Washington Automobile Club.

WASHINGTON, D. C., April 21.—The Automobile Club of Washington expects to be installed in its new country home on the Brightwood road about June 15. The contract for the bungalow to be erected by the club will be awarded within the next few days, and the work pushed to a speedy conclusion. Col. C. E. Wood, vice-president of the club, is chairman of the finance committee, which has entire charge of the work of construction.

CLUB DOINGS IN GENERAL.

BROOKLYN, N. Y.—The runs and tours committee of the Long Island Automobile Club, consisting of Dr. Clinton B. Parker, chairman; W. T. Wintringham, secretary, and A. R. Partington, has announced four club competitions for the season, as follows: Emanuel mileage trophy, Partington attendance award, Edwards meandering memento and the Parker economy prize. Odometers are to be officially read for the mileage trophy, and the attendance award goes to the member participating in the most regular club runs driving his own car. The meandering memento is for the member driving his car in the largest number of states, territories, provinces or foreign countries. Conditions and dates of the economy test are not yet announced.

On Friday evening, April 19, a party of 400 members attended the performance of "The Vanderbilt Cup," at the Broadway Theatre, New York. The occasion was one of much enjoyment.

FOND DU LAC, WIS.—Realizing the benefits to be gained through organization, local automobilists have banded themselves together under the name of the Fond du Lac Automobile Club. The primary object of the club is to launch a movement in the northern section of Wisconsin for the improvement of public highways. Interest in automobiling has been given a decided impetus this spring, and new machines are arriving daily. The total number of cars in this city is about forty-five, which added to the number of autos in cities close at hand—Waupun, Ripon, Oakfield and Brandon—constitute a respectable showing. Autoists in these cities will be entitled to membership.

SIoux CITY, IA.—At a recent meeting of the Automobile Club of this city, the following officers were elected for the ensuing year: President, Dr. F. A. Seamann; vice-president, W. E. Lockhart; secretary-treasurer, H. B. Hallam; trustees, W. H. Farnsworth, John McHugh and Herbert Petton. Negotiations are under way with the Country Club to secure the clubhouse as headquarters for the automobilists, and a series of meets and social affairs will be planned later in the season. The club has twenty-eight members.

ROCKFORD, ILL.—Invitations have been sent out by the Rockford Automobile Club to President Farson and Secretary Gorham, of the American Automobile Association, to attend a banquet

which will be given in their honor. Secretary Dickerman, of the Rockford club, who forwarded the invitations, asks the national officers to set their own date for the banquet, and from replies received it will be held the latter part of May. The Rockford club is about to apply for membership in the American Automobile Association through the Illinois State Association, which is affiliated with the A. A. A.

DES MOINES, IA.—Secretary Frank L. Kern of the Iowa Automobile Club of this city announces that a program of club runs, hill climbing contests, parades, out-door shows and other events is being arranged by the executive committee of the club, and that Des Moines will experience the liveliest automobile year in her history during the coming season. It is estimated that over 150 new machines will be added to the city automobile column before fall.

MINNEAPOLIS, MINN.—At the last meeting of the board of directors of the Minneapolis Automobile Club, eighteen new members were elected. New committees for the year were announced as follows: Laws and Ordinances, E. J. Phelps, chairman; W. Y. Chute, Dr. C. H. Kohler; Good Roads, F. R. Schoonmacker, chairman; G. A. Will, George W. Cooley, John Leslie and Dr. A. P. Walrath. The new clubrooms in the Plaza Hotel will be ready for occupancy May 1.

EFFECTIVENESS OF HORSEPOWER TESTS.

William Hodgkinson, a noted English mechanical expert, in a recent issue of the *Automotor Journal* writes interestingly of horsepower tests and requirements as follows:

"As an electrical engineer I find the discussion with regard to the rating of automobile engines very interesting, but scarcely practical, since what the buyer of a car wants to know is not merely what horsepower an engine will generate when running on a test bench at a predetermined speed, but what it will do when running on a car.

"The actual horsepower required to tow a car at the legal limit of speed on the level is only a fraction of the power that the engine is rated at, the extra power provided being required for rapid acceleration and to enable the car to surmount heavy gradients under unfavorable conditions. On gradients the engine slows down and only develops a portion of its rated output, so that the full power is only developed at very high car speeds, when it is required to overcome the resistance due to increased windage.

"With these premises it seems absurd to endeavor to classify motors according to the cubical contents of the working space in their cylinders and the revolutions per minute of their crankshafts, unless the clearance space above the top of the pistons and the length of stroke are also taken into consideration, since the mean effective pressure on the piston, and therefore the horsepower per stroke, depends largely on the quantity of the heated gases behind the piston and not only on the initial pressure generated by the explosion.

"I am of opinion that what the buyer wants to know is not the horsepower of the engine, but what a car will do on the road with standard gearing, and instead of determining the horsepower of an engine by a brake test I would suggest that complete chassis loaded to an amount equal to the weight of the body and passengers be run on a smooth graded track, the first portion of which should be level, to allow full speed to be got up, and terminating in a gradient sufficient to stop any powered car. Times could be recorded electrically as the car passed points a few yards apart, and from the speed curve so obtained and the known weight of the car the effective horsepower at the road wheels could be calculated."

CONNECTICUT TO BUILD MORE TRUNK ROADS.

NEW HAVEN, CONN., April 23.—Now that spring has arrived and the trunk roads are in fairly good shape, Highway Commissioner J. H. Macdonald has resurrected his roadmaking implements and is mapping out a strenuous campaign for the coming months.

Commissioner Macdonald states that he will complete two trunk lines across the State; one from the New York State line at Greenwich to the line between the towns of Stonington and Westerly, R. I., and the other from New Haven to Springfield, Mass. These routes are old post roads, among the first built in the colony, and are still the most traveled thoroughfares.

By far the most important is the Shore road from Greenwich to Westerly, 120 miles in length. Work has been going on on this road for several years. It is a most important highway for automobilists and is used almost exclusively by New York automobilists in going to and from Newport. It is said that an actual count taken last summer showed that New York and New Jersey cars passing on this road far outnumbered those of Connecticut registry. There are several sections on this long stretch of road which remain to be built, and work on these will be pushed as rapidly as possible during the next few months. At Greenwich, beginning at the New York line, a curve will be eliminated and considerable grading done. Fifty thousand dollars has been appropriated, to be used under the direction of Commissioner Macdonald in filling gaps in trunk lines this year.

Two ferries, one over the Connecticut river between Old Saybrook and Old Lyme and the other between New London and Groton, are causing the commissioner no little trouble. A ferry is a decided hindrance, and the one over the Connecticut river is an especial annoyance. It is suggested that as the New York, New Haven & Hartford Railroad Company is building a new bridge over the river south of the present one, the towns of Old Saybrook and Old Lyme might make some arrangement by which the old bridge might be secured and made over for highway traffic.

No such solution presents itself in the ferry problem between New London and Groton, where the approach to the ferry is over a dangerous grade crossing. The ferry service is good, however, and is likely to remain. From Groton to the Rhode Island line the road is in good shape. Commissioner Macdonald is planning

to complete most of the work on the Shore road the present year. On the road from New Haven to Springfield, a short stretch of gravel road is to be built in North Haven and another section of the same type between Wallingford and Meriden. Both will be built this year, and also a stretch in Berlin, which will give a continuous State road between New Haven and Hartford by way of North Haven, Wallingford, Meriden, and Berlin.

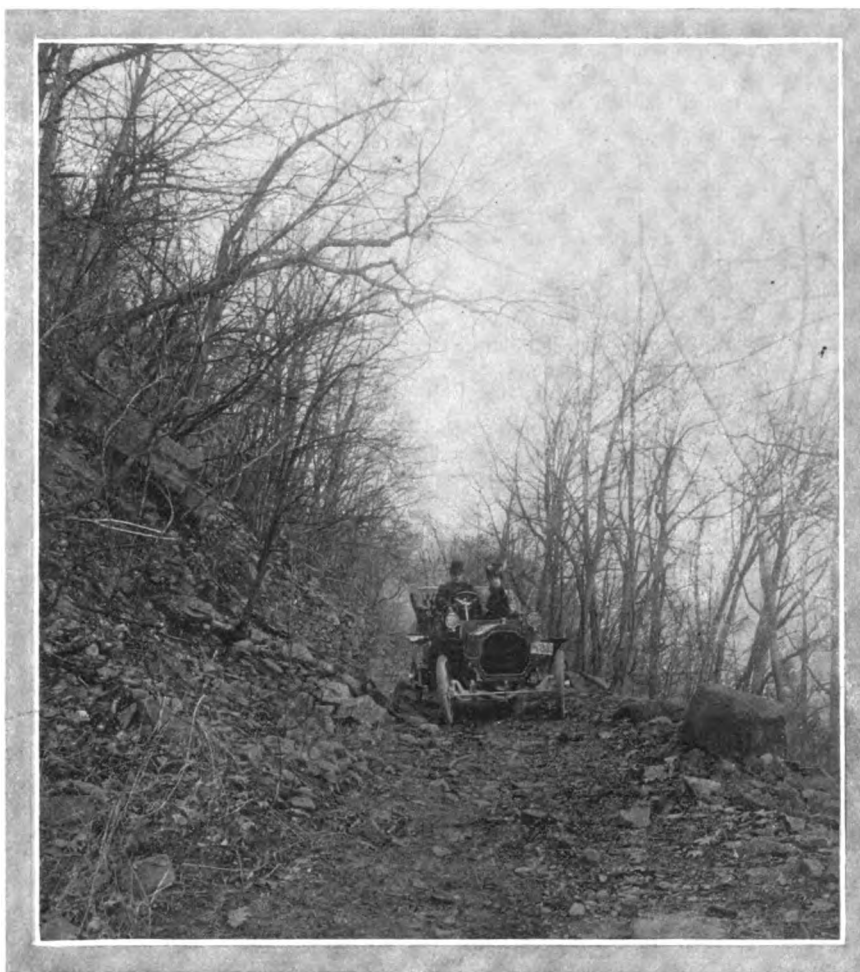
The West Side road from Hartford to Springfield is the main thoroughfare between Hartford and Springfield, but at the present time the road on the east side of the Connecticut river through East Hartford, South Windsor, East Windsor, and Enfield is as good as that on the west side of the river.

On the west side there is a bad stretch of road from Hayden's Station through Windsor Locks, the road to Windsor and north of Windsor Locks being in fairly good shape. On the east side a strip of highway in South Windsor and another through to Warehouse Point will be rebuilt.

Another important piece of construction work will be the improvement of the highway between Farmington and West Hartford. It will be finished this year and will complete a continuous stretch of State road from Hartford to Unionville. This work is being aided by liberal subscriptions from individuals as well as by the State, and when completed will be one of the finest pieces of highway in Connecticut. It runs through the aristocratic Farmington section.

Another highway in which automobil-

ists are interested is on the west side of the river, from Saybrook Point to Hartford. The road from Middletown to Hartford is completed, and the Rocky Hill people are now spending considerable money on a road across the town from east to west. Half the distance between Middletown and Haddam has been built, and the other section will be finished this year. The town of Chester has one short section to build, and the neighboring town of Saybrook has completed its road from Essex to the Chester line. Essex was one of the first towns in the State to build an improved highway, and has still one section of road to complete on the river road, as has Old Saybrook. The road from Hartford to Middletown has been completed and probably two-thirds of the distance between Middletown and Long Island Sound has been finished. Commissioner Macdonald is also very busy supervising the con-



IT IS ROUGH GOING ON THE JERSEY PALISADES, BUT A PACKARD MEETS THE TASK.

struction of a line of improved roads northwest through Bloomfield, Collinsville, Winsted, Canaan, and the Berkshire Hills to the New York line. Work has already been started in Bloomfield, Tariffville, and Collinsville. There is much grading to be done, owing to the hilly country, but within two years this section will be one of the finest for auto touring in the country.

Commissioner Macdonald is an enthusiastic automobilist, and believes that the auto will be a great factor in promoting the good roads movement through the country. He is against the practice of automobilists using chains to prevent skidding, and states that this practice is very detrimental to surface dressing.

CONGRESS IS REALIZING THE NEED.

WASHINGTON, D. C., April 23.—During the course of his recent speech on good roads in the House of Representatives, referred to in the last issue of *THE AUTOMOBILE*, Representative Gordon Lee said that when we find we are in the wrong road, no matter how long or how far we have traveled, it is the part of wisdom to stop and change our course. For a hundred years we have waited for this road problem to be worked out under the old methods, and we are only getting deeper in the mud.

"To the principle and practice of extending federal aid to road building we have already been long committed," said he. "I take pleasure in mentioning the fact that more than seventy years ago John C. Calhoun, of South Carolina, advocated the very idea proposed in a bill which I introduced here recently. He advocated the division of the surplus among the States and the expenditure of it by the States in road building.

"But if there were neither law nor precedent for the general government to engage in road building, it is high time we were making both. Congress is wisely encouraging and sustaining the Post Office Department in its efforts to extend the wonderfully vitalizing and educating benefits of free rural mail delivery. To send these mails daily over such roads as we have now must be done at the expenditure of money and labor and energy and time, that would be reduced in many instances by half if the roads were given proper attention.

"I do not believe this Congress can make a more useful expenditure of public funds than in the direction I have indicated, nor one that would be more immediately and lastingly popular and beneficial. Then shall every interest be guarded by national legislation, and the welfare of that class which affords sustenance to all classes be not neglected."

It is interesting to note that Representative Lee's great speech has had the effect of awakening new interest in the good roads propaganda. Many members of Congress who have hitherto been rather lukewarm on the good roads proposition have come out enthusiastically in favor of federal aid in improving the roads since Mr. Lee pointed out to them so conclusively the benefits that would be derived by the country at large if the national government took hold of road improvements.

GOOD MARKET IN ARGENTINE REPUBLIC.

South America should offer a good market for American automobiles, both new and second-hand, as there is a good demand there, particularly in the Argentine Republic, for European cars. Our own machines, especially built for rough roads, are better suited to the needs in the Argentine than Continental cars. Second-hand automobiles are also wanted in South America, Consul-General Ridgely, in Barcelona, writing that an advertisement in several European newspapers called for 100 such cars of any and all makes, ranging in price from \$100 to \$3,000. The only automobile factory in Barcelona, he added, though overpressed with local orders, had recently made several high-class automobiles for shipment to Buenos Ayres.

The value of the automobiles exported from France during January was \$2,046,000, or more than double the total for the same month in 1905.

AUTOMOBILE RURAL FREE DELIVERY.

By E. P. CHALFANT.

Less than five years ago the automobile was regarded as a "millionaire's pastime," altogether out of the reach of the salaried man, both as to purchase price and subsequent maintenance. That was indeed the case when cars cost from \$5,000 upwards to the sky, the expense of operation about \$100 a month and the services required of a chauffeur or expert mechanic at another hundred.

But the automobile industry has not remained at a standstill any more than has Uncle Sam's mail service, and during the interval cars have been designed and introduced that sell at prices within ordinary speaking distance, that cost but a few dollars per month to maintain; and so extremely simple in construction that any man of ordinary intelligence can quickly learn to operate it himself and make what few repairs may become necessary.

As applied to the rural mail service, it does not follow that an automobile can be used on every one of them, for some routes are too rough for a horseback rider to travel safely; neither is it certain they can carry the mail 300 working days a year. But there are hundreds, perhaps thousands, of routes where an automobile can be driven satisfactorily for at least 250 days a year. It is not even necessary to keep a horse for use in emergencies, for a horse can be hired from the nearest livery upon occasion, and for a small amount.

Compare the expense and the results obtained by the automobile as against the team.

It is safe to estimate that a carrier requires an average of two and a half horses a year, or at least the expense of same. Two good horses are worth \$100 each; a mail wagon, \$75; two sets of harness, \$25; the cost of keeping will average \$10 a month for each horse, and the shoeing and doctoring, as well as repairs of the wagon, amount to a considerable item in the course of the year. An early morning start and a late finish make a full tiresome day for a carrier.

Opposed to this is the Orient buckboard, at a first cost of \$400 and expense of a half cent a mile for gasoline and oil, an average expense of three to five dollars per month for repairs and renewals, which includes tires, the principal cost of an automobile. Under ordinary usage on the road a set of tires should last about fifteen months. The cost of renewing tires amounts to \$13.50 each. The route is quickly covered and the carrier has three or four extra hours at his disposal in which he can earn extra dollars on the side, and what could be easier than carrying passengers in his car, for which good, substantial rates can be charged.

It is not to be supposed that a carrier, or any one else buying a new automobile with whose construction he is unfamiliar, can jump right in and drive it off as though it were as simple as a wheelbarrow. For that matter, a novice cannot ride horseback nor drive a buggy until he learns how it is properly done. Any modern machinery, automobile or otherwise, requires care and attention, proper lubrication and adjustment, all of which is made simply by a reasonable study in advance of the construction of the car and its requirements. Any intelligent man, even though not of a mechanical turn, can learn in a few hours how to drive the car safely, and in a week's time should be reasonably expert.

Country roads are constantly being improved, in which work the rural carriers have become an important factor. As the roads grow better the advantages of the automobile over the horse become more and more apparent. There are many automobiles in use in rural free delivery service, and it is a safe statement that no carrier who has ever used a motor-driven vehicle could be induced to return to the horse and wagon methods.

An automobile road between Bangkok, Siam, and Penang, Straits Settlements, is under consideration. The distance will be 700 miles, the object being quicker postal communications with Europe and more rapid passenger traffic. The road will also result in a closer relation between the native states and Siam.

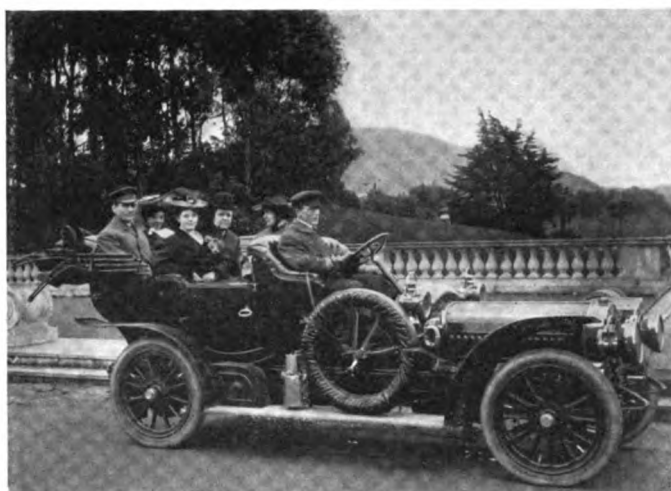
NEW SIX-CYLINDER GEARLESS CAR.

The gearless gasoline car has made its appearance in England, in the form of a six-cylinder Napier. In the columns of the current issue of *English Motor*, the new production is described and commented upon in a clear and logical manner, as follows:

"There are many who recognize the advantages which, in some directions, would accrue from the absence of change-speed gears in the driving mechanism of the gasoline car, and many attempts have been made to equal the simplicity, in this respect, of the steam car. An eight-cylindere car was made about two years or more ago by Messrs. Charron, Girardot, and Voigt. This had a low starting gear, but all the rest of the work was done on the top direct gear. It was not a commercial success, and, except at the shows, nothing was seen of it. Those responsible for the prominence of the Napier cars—D. Napier & Sons and S. F. Edge, Ltd.—have now produced a car which is intended to supply the demand for a gearless car, although it must be distinctly understood that it is not intended to entirely replace the ordinary type, which, in the hands of the skilful and attentive driver, presents no difficulties or disabilities. The new gearless Napier can be obtained optionally with the ordinary type, and it has been developed from the six-cylindere car, the ample horsepower of which has made the scheme practical. But horsepower alone is insufficient, as we shall show. From the very first the aim of Mr. Napier has been to increase the flexibility of his internal combustion engine, and to him is due the credit for recognizing the fact that the six-cylindere engine is not merely a four-cylindere engine with two more cylinders tacked on. He recognized the value of the more continuous torque, and he next aimed at the development of power at slow speeds, whilst another aim was to secure a constant increase of power with each increase (in reason) in engine speed beyond the normal speed of the engine. The normal speed of a six-cylinder Napier engine is 1,600 revolutions per minute, and, as the result of continuous work, we have it on Mr. Edge's authority that this type of engine has been made to run at the extremely low speed of 60 revolutions per minute, whilst a continuous increase of power can be secured up to a speed in excess of 2,000 revolutions per minute, whereas, as is well known, it is quite the usual thing for the power to fall away should an engine be very much over-run.

"Having secured high power, nearly even torque, and extreme flexibility, the next thing was a clutch suitable to the work required of a gearless car, and, after many experiments with various types of multiple disk clutches, one has been adopted, and a chassis has been equipped with it, deprived of all its gears (except, of course, the reverse), and was being tried on the road by Mr. Edge at the week-end. The clutch, running in oil, shows the necessary slip when starting, and Mr. Edge says that the car can be started from a standstill on a steep up-grade. The engine will propel the car at from two miles an hour up to the highest speed that has been attained by a six-cylinder Napier touring car, and, owing to the efficiency of the engine at slow engine speeds, it can master any gradient without the need for the interposition of a reducing gear. On an exceptionally heavy grade under adverse conditions the clutch may also be slipped to allow the engine to recover speed, but such an experiment is scarcely likely to be necessary. There is no gear box to absorb power through four right angles, the power being taken direct from engine to differential.

"Certain advantages accrue from the absence of a gear box, notably cheaper production, cheaper upkeep, a saving in labor and attention, a simpler and lighter mechanism, the elimination of a possible source of trouble, while the notoriously bad-gear-changing type of paid driver is provided against. Many owners will prefer a geared car, but for certain work there will be many who will give the preference to one without gears."



DOUGLAS TALBOT, MILLIONAIRE CALIFORNIAN, IN HIS THOMAS.

International Motorcycle Date Changed.

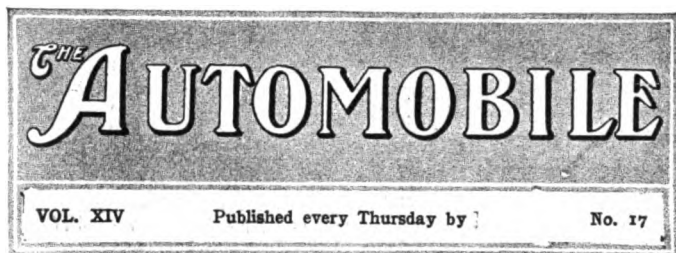
Entries for the International Cup race for motorcycles closed on April 18, with practically all the European countries represented. The date of the race has been changed from June 29 to July 8, at the request of the Moto Cycle Club de France. The start and finish of the race will be at a point called Smrci, one kilometre from Patzau, Austria, which is some distance from the city of Prague, in the province of Bohemia. The course is 62.2 kilometres in length, over what is called "national routes," and which are eight yards wide or more. The Cesky Club Motocyclistu of Austria is the promoter of the race, and has made every provision for the comfort of foreign motorcyclists, not the least of which is printed directions in different languages.

Mrs. "Dan" Gaines of Colorado.

COLORADO SPRINGS, COLO., April 23.—Mrs. "Dan" Gaines has learned to run an automobile, but not for pastime. She will ply the machine in her business in this city, taking tourists over mountain roads, through the Garden of the Gods on moonlight nights, and maybe going up Pike's Peak when the auto record run is made next fall. For years Mrs. Gaines has been a character in the Pike's Peak region and has been known as "the original and only woman hack driver." She handles horses like a man, drums up trade at the railroad station, has a trust on the theatrical business, pulls politics to a certain degree and is a power to be reckoned with. No carriage driver in Colorado Springs or Manitou makes the money that Mrs. Gaines does.



MRS. "DAN" GAINES, "WOMAN HACK-DRIVER," IN HER WHITE.



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**Don't Drive Until You
Are Proficient.**

It is with a feeling of apprehension that the observing automobilist every Monday morning at this time of year scans the columns of the daily press for the Sunday grist of automobile mishaps. The highways this spring on a Sunday morning are unusually filled with automobiles, and among those who drive are a substantial percentage of new owners, many of whom venture into the maelstrom of the open road before they have become thoroughly proficient in operating ability.

The mere starting and stopping of an automobile does not mean that one has necessarily become capable of piloting it successfully under the many varied conditions that are to be encountered on the highway. When it comes to a close call, wherein one must act quickly and correctly, the inexperienced driver frequently fails to meet the emergency, and the results are more or less distressing, and frequently fatal. Before one ventures into the crowded traffic of a city, or even attempts the risks of country driving, with its descents of difficult hills and abrupt turns, he should be thoroughly master of the responsive vehicle which answers to his every touch, but that touch must be of the right sort and promptly applied in case of urgency.

Accustom yourself thoroughly to riding in the front seat, and study well the recurring problems of the road, so that when you take the place at the wheel it will be with a complete appreciation of its responsibilities and demands, for it is nothing short of criminal when the novice accepts chances which include not only those with him but all other users of the road and the pedestrians who cross it. Never drive at high speed until you feel completely in control of your automobile, and never leave the garage until the car has been thoroughly examined and is declared to be in satisfactory working order.

factory working order. With an automobile a repair in time often means much, and many an accident has been avoided by this essential inspection before a car starts on its journey.



**Changing Styles in
Auto Tops.**

Victoria tops are going to be extensively used this summer on the more expensive big touring cars, especially those imported from Europe. They will be most noticeable in and about New York, for many of the orders placed with metropolitan body building companies for costly bodies during the past winter and this spring have specified Victoria tops. The same tendency will probably also be observable in Boston and Philadelphia. This style of top is well suited for town and country use, as distinguished from long-distance touring. The grained enameled leather, in black, the graceful form and the generally excellent finish make it harmonize well with the highest priced and best finished cars.

It is interesting to trace the changes of style in tops. In the earlier days such few machines—then mostly steamers and electrics—as had tops were fitted with canopy and buggy tops, the former on surreys and the buggy tops on light runabouts. Physicians' cars had phaeton or Victoria tops. Although the buggy and Victoria tops have survived to the present time, the touring car top has undergone many changes. The canopy top went out of fashion with the old-style steam vehicles and there succeeded an era of topless gasoline tonneau cars that lasted for several years. Meantime the limousine and other types of vehicles appeared, rather as exceptions and models *de luxe* to be marveled at, but the machine for hard country road work went practically without protection until the Cape car hood came into vogue with a rush two years ago. To-day hardly a car is built without being fitted with irons to take a top.

The Cape top, being light, easily attached and removed, and coming down low on all sides, was deservedly popular. Doubtless it will continue to be used for country work, but the unfinished appearance of its khaki cloth and the arrangement of its four bows radiating from a single point at the side of the car were against it, and when the side-entrance body became universal last year the present type of four-bow extension top was adopted as offering no obstruction to entering and leaving the car from the side. At the shows last winter extension tops with coverings of mackintosh cloth in various neutral colors, pantasote and real leather were most commonly shown in the sundries stalls. No doubt, for touring purposes, they will be most extensively used this season.

The extension top is more democratic or plebian than the Victoria top, for it extends forward over the front seat, affording protection to the driver as well as to the occupants of the rear seat, whereas the Victoria top covers the rear seat only and curves well down against the driver's back. It is shut in on the sides by permanent leather curtains, but has a small light in the rear. Generally it is made with four stout, low bows and outside joints and can be folded back out of the way when the weather is pleasant. It gives a car a rich and exclusive appearance, which accounts for its popularity with owners of costly machines.



**Congress and the
Question of Roads.**

It has been a long time in coming, but at last it would seem that Congress was awakening to a realization of the necessity and wisdom of national aid in the construction of national roads. Representative Lee, in his recent convincing speech, referred to the fact that none other than the far-seeing Calhoun had advocated federal aid seventy years ago. Every week now brings with it additional news happenings that tell of the widespread growing opinion which will soon be a demand for general road building. In these premises the automobilist no longer should remain in the rear guard, and all the help and influence which this army of road users possesses should be directed into the strong current that is sweeping away opposition which has neither the defense of economy nor the welfare of the country in its reason for existence.

SENATE MAY KILL ALCOHOL BILL.

WASHINGTON, D. C., April 23.—The advocates of the free alcohol bill realize that a fight will be made against the measure in the Senate. The action of the House of Representatives in passing the bill by an overwhelming vote of 222 to 7, made it appear that the bill would go through the Senate with very little opposition, but since then a number of things have come up to cloud the issue. The proposition has been made to attach the Philippine tariff bill to the free alcohol bill in order to force the former through the Senate, and quite a number of senators have come out boldly in favor of such a proposition. If this action is taken it will strike a death blow to the alcohol bill.

At this writing the bill is pending before the Senate Finance Committee, and it has not yet been determined whether the committee will grant hearings on the bill. Extensive hearings were given before the House Committee on Ways and Means, and it would seem that the entire situation had been gone over so thoroughly that nothing new could be adduced. There has been some talk of making the alcohol bill a tariff issue, and if that is done the situation will become so complicated that nothing can save the bill at this session of Congress.

Still another stumbling block in the way of the alcohol measure is the railroad rate bill. If the debate on the latter measure is extended, there will undoubtedly be opposition to reporting the alcohol bill to the Senate before the next session. All in all, the situation is anything but promising for the free alcohol bill.

AUTOMOBILES IN RELIEF WORK.

Never has the automobile had such a chance to vindicate itself as in the San Francisco earthquake disaster. The correspondent for one New York newspaper goes so far as to declare that "the automobiles have saved the day for San Francisco." In the very first hour following the most destructive shocks, the owners of hundreds of private machines made the utmost use of them in hurrying their families and some of their personal effects to places of safety. Later, every automobile in the city was commandeered by the military or civil authorities and pressed into the service of transporting food supplies to the parks, where supply depots were hurriedly established to feed the hungry throngs. The Red Cross Society carried on all of its messenger work with automobiles, which whizzed about in all sections with the streaming Red Cross flags warning all to make way for them. Day and night ever since that frightful early morning nearly a week ago, the cars have been driven on their errands of mercy, nearly always at top speed, carrying food to the hungry, surgical aid and medical relief to the injured and sick, and clothing and shelter to the homeless.

PERCY PIERCE SAILS MAY 5 FOR EUROPE.

Percy Pierce, winner of the 1905 A. A. A. tour for the Glidden trophy, will sail for Europe, May 5, on the *Patricia*. He will first participate in the Herkomer tour, a German event with a 1,000 mileage. This event will start June 5 at Frankfort-on-the-Main, the route going to Vienna and the conclusion being at Munich.

But the big event and one that will try to the utmost the ability of the best touring cars will be the European Circuit, starting from Paris, July 29, and continuing over a route of more than 3,000 miles. Mr. Pierce expects to gain experience in the Herkomer event that will prove valuable in the more trying contest.

Gilbert F. Heublein, of Hartford, Conn., is another American who will participate in the Herkomer tour, but he will drive an English Daimler.

An Irish Reliability tour open only to amateurs is contemplated for the second week in June, under the auspices of the Irish A. C., now the acknowledged automobile body in the Emerald Isle. The trials will consist of three runs of 100 miles each, starting and finishing daily in Dublin, and a hill climb in Wicklow County.

QUAKERS OBJECT TO SIRENS IN CITY.

PHILADELPHIA, April 23.—Some time during the coming fortnight City Councils will consider the advisability of prohibiting the use, within the city limits, of siren horns. This matter was brought to the local Solons' attention by Jacob J. Seeds, chairman of the Legislative Committee of the Automobile Club of Philadelphia, who introduced an ordinance which reads as follows:

To designate the signal of warning to be sounded by automobiles or power vehicles within city limits.

Section 1. The Select and Common Councils of the City of Philadelphia do ordain, That on and after the passage of this ordinance all automobiles, wagons and other vehicles operated by power other than animal or hand power, shall use and are hereby compelled to carry as a note of alarm or warning that which is commonly known as the toot-horn or horn sounding one note only, and it shall be unlawful to sound or blow any other contrivance or instrument while being operated within city limits. In case of the violation of any of the provisions of this ordinance by any person operating any vehicle a fine of ten (10) dollars shall be imposed, said fine to be levied and collected as like fines are now levied and collected by law.

The club's action in the matter was based upon the numerous complaints which had been sent to it, as the governing automobile body of the city, charging that many accidents had been caused by the fearsome sounds proceeding from siren horns. The board of governors finally took action in the matter, and after a long discussion the legislative committee was given power to act.

B-L-M CAR FOR THE VANDERBILT RACE.

The B-L-M car for the Vanderbilt race will be of the four-cylinder type, weigh about 1,800 pounds, and be chain-driven. It has been erroneously stated that this racer was exhibited last winter at the Automobile Club of America show, when as a matter of fact the car is now in process of construction under the personal attention of Arthur T. Moulton, the designer. The car will be of 80 horsepower, with a bore and stroke of 6 inches, and will have four speeds and a reverse, sliding gears, controlled by means of the selective system. The wheelbase will be 106 inches, and all the steel parts will be of nickel-chrome steel.

The racer should not be confounded with the fast runabout model which the B-L-M Motor Car & Equipment Company is building and designates as the "Pirate." This runabout is a compact car with a four-cylinder motor of about 4 inches bore, weighing complete 1,400 pounds, and will sell for \$3,500. The company does not desire that its racer be known as the "Pirate," considering that the "B-L-M" will answer all practical purposes. Though nothing positive has been arranged, it is among the possibilities that Joe Tracy may drive the car.

NEW JERSEY LICENSES ARE NOW DUE.

TRENTON, N. J., April 23.—Assistant Secretary of State J. B. R. Smith, who is Motor Commissioner under the new automobile law, is sending out notices that there has been widespread error in the statement that the provisions of the automobile act do not go into effect until July 1. He says that the penalties in the act go into effect on July 1, but licenses are now due and must be renewed. By May 1 the automobile department will be organized, and then new licenses under the statute at the rate of \$3 for cars up to 30-horsepower and \$5 for cars beyond that limit will be ready for issuance. Applications for licenses should be sent in now to avoid the expected rush later.

Burlington railroad officials are making preparations to build a fine highway from Worland, Wyoming, to Thermopolis, and will start an automobile stage line when the Shoshoni Reservation is opened. The Burlington will be able to complete its southern branch only as far as Worland in time for the opening, and to carry passengers to the edge of the reservation will adopt the automobile stage plan.

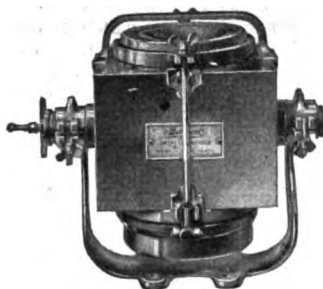
AN INVERTIBLE GAS PRODUCER.

In the new Neverout invertible gas producer, manufactured by the Rose Manufacturing Company, 910 Arch street, Philadelphia, an attractive proposition is presented to automobilists. Its operation is certainly simple, and the further advantage of economy in consumption of fuel, and of producing and shutting off gas instantly, are two strong points set forth by the makers.

This producer, or generator, is entirely automatic in its action. A half revolution of the device turns on the gas and instantly starts generation of gas. When the device is revolved back to its original position, that is, inverted, the gas is immediately auto-

matically shut off and generation of gas stopped at once. This is accomplished by means of an automatic valve, which cuts off or turns on the gas, and the fact that in inverting the device the contact between the wet carbide and the dry is immediately broken.

The Neverout gas producer is swung on an axial bracket, as shown in the cut, and can be conveniently rotated. It is constructed on an entirely different principle from other generators. The carbide container is a metallic cylinder with plain surfaces. When the gas is turned off, the water is automatically at the same time also turned off. Conversely, when the gas is turned on (by revolving the device), the water and carbide are again brought into contact. One action only—a half revolution of the device—is needed to start or stop generation and to turn the gas off or on, and there is no cock or valve to attend to. A very great advantage claimed is that there is no waiting for gas to generate, and another is that it is so simple and absolutely automatic in its action that the most careless or inexperienced user cannot use it wrongly or make any mistake with it. It is put together in such a manner that one or two turns of two butterfly nuts disassembles or reassembles the whole thing, which consists of but few parts, all strongly made and durable.



NEW SPRINGFIELD FACTORY ADDITION.

One of the best proofs positive of business increase with a manufacturing concern is an addition to its plant. The Springfield Metal Body Company, of Springfield, Mass., has just completed the three-story structure shown in the illustration, which gives an addition of 48,000 square feet of floor space to an already large factory. The works and offices are located at Medford and Birnie avenues, Brightwood, a suburb of Springfield, and contain one of the most complete equipments in the country for the manufacture of aluminum automobile bodies, fenders, etc.



NEW ADDITION TO SPRINGFIELD METAL BODY CO.'S PLANT.

FOREIGN MAKERS ENTER TORONTO.

TORONTO, ONT., April 23.—There is a noticeable tendency in the Canadian automobile trade toward a larger purchase of European cars. An increasing number of agencies for foreign cars are being opened up, and leading dealers who previously have been handling American cars exclusively are adding one or more British or Continental makes to their lines.

In the last few weeks a new company has started in Toronto, called the British and French Motor Company, capitalized at \$100,000. This company will sell the Panhard, Argyle, De Dion, Minerva, Daimler and Swift.

In the Mutual Street Rink about \$40,000 worth of cars were displayed at the show conducted here under the management of E. J. Turnbull, R. M. Jaffray and Dai H. Lewis, who are holding another show on a larger scale in Montreal this week.

The advantages claimed for British cars by this company are the preferential duty, which makes a difference of about 11 2-3 per cent.; second, sentiment in favor of British goods; and third, alleged superior quality of foreign over American cars. Whether the two latter arguments hold good or not, of course, is a subject of dispute.

Among the cars sold by other dealers are the Darracq, handled in Toronto by Hyslop Bros., Ltd., and in Montreal by the Canadian Automobile Company; the Humber, handled in Toronto by Hyslop Bros. and in Montreal by the Automobile Import Co.; the Clément-Bayard, Napier and Fiat, controlled for Canada by the Dominion Automobile Company. The Automobile & Supply Co., of Toronto, has lately taken the agency for the English Star and the Sunbeam.

Most of the foreign cars mentioned require considerable adjustment to meet the conditions of the Canadian roads, such, for instance, as the change from the narrow to the standard tread and increased height of body from the ground.

Private Owners Will Build Garage.

To solve the problem of storage a plan has been evolved by well-known enthusiasts to erect a central private garage. A lot in the residential section has been purchased and application made for letters of incorporation for a company, to be known as the Private Garage, Limited. The structure will store ten machines, and will be fully equipped for the repair of cars and the accommodation of chauffeurs.

WHAT IS DOING IN INDIANA.

INDIANAPOLIS, IND., April 23.—F. O. Johnson, of Pasadena, Cal., has purchased the 1906 Peerless automobile belonging to Crawford Fairbanks, of this city, and will make a tour of Indiana. Mr. Fairbanks will purchase a 45-horsepower Peerless and will accompany Mr. Johnson on the trip.

The first invasion of automobiles into Brown county, Ind., will be made one Sunday in May, when a party of Reo owners will make a run to the site of the hotel James Whitcomb Riley, the Hoosier poet, will build. Riley will be a member of the party, which will probably number a dozen owners of cars and their friends. Brown county is the most hilly county in the State and the least settled. Only one railroad goes through the county, and the first train was run over it last Sunday.

The Gibson-Short Cycle and Auto Company have sold Reo runabouts to J. B. Gilson and Charles McBride, both farmers, living in Rush county, Ind. Five automobiles have been sold to farmers in this county in the last two months.

Local factories are experiencing some difficulty in getting materials for cars, and it is probable the National Motor Vehicle Company will have to lay off a number of employees, awaiting the arrival of material. There is also some danger of a coal famine among automobile factories. The National factory announces it has enough coal to operate the factory two months, and other concerns have about the same supply. There is no more coal in sight and a speedy settlement of the coal strike is hoped for.

MONTREAL'S FIRST SHOW.

MONTREAL, QUE., April 21.—If the attendance at the opening of the first automobile show ever held in Montreal is any criterion of what is to follow, the number in attendance will be a record one. From the time the doors opened till the last minute of closing, the place was crowded with sightseers, which certainly should give impetus to the automobile business in this city this year. It was a fashionable crowd that were present, resembling in a great measure those who usually attend the horse show.

Out of the 57 spaces, with the exception of a couple of booths which have since been disposed of, everything was occupied. There are quite a number of firms who now regret their indecision and wish they were represented. Two-thirds of the cars represented are American models.

Ernest Arnott, a representative of the firm which makes the Minerva car in Belgium, is here to take a look over the field.

A great many people were disappointed at the non-exhibiting of motor boats, which was to prove one of the essential features of the show, but the management explained it was through no fault of theirs that the firms backed out at the last minute. Automobile accessories are shown in abundance, as well as motor boat accessories.

DENVER'S SUCCESSFUL SHOW.

DENVER, COL., April 20.—The big Denver automobile show is on at Coliseum Hall. Larger crowds than ever before seen at a like event have been in attendance almost constantly since the doors were swung open to the public. Automobiles of all sizes, makes, and colors, ranging up from the miniature Moline car, for which the company has been offered \$4,000, are on exhibition. The most conspicuous exhibitor is the E. A. Colburn Company, which has taken an entire square to feature its stock. Included in its display is a \$5,000 Locomobile.

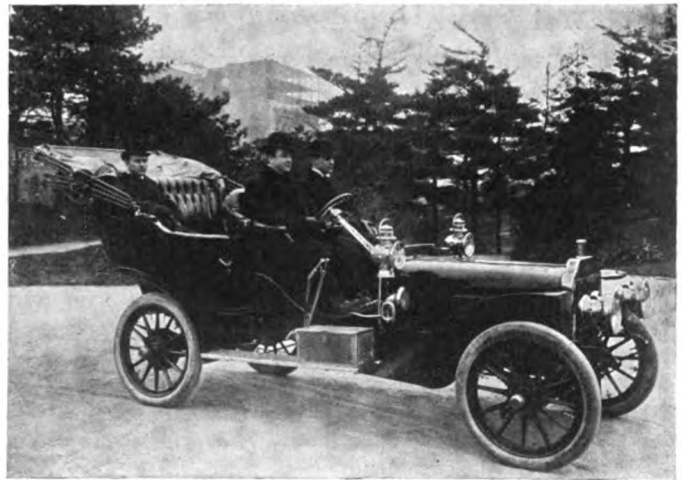
ILL WIND THAT BLOWS QUAKERWARD.

PHILADELPHIA, April 23.—The truth of the "ill wind" adage was never better demonstrated than during the past week, when, owing to the cataclysm in San Francisco, the Pierce-Arrow agents in that city were released by the company at Buffalo, and their consignment transferred to the Foss & Hughes Company, of this city, which has been having all kinds of trouble in securing a sufficient number of cars to meet the demands of its patrons. According to the terms of the transfer, Foss & Hughes will pay the San Francisco agents a profit on each car so transferred, and which would be thrown back on their hands owing to inability of buyers there to meet their obligations. The local firm has also offered to pay to all present owners of 1906 Pierce cars in the stricken city the regular catalogue price for their machines, should they desire to dispose of them.

PARAGON AIR-COOLED RUNABOUT.

One of the main features of the Paragon Runabout, manufactured by the Detroit Automobile Manufacturing Company, of Detroit, Mich., is the transmission, which is of special pattern and used by this concern exclusively. It is of the planetary type, two speeds forward and reverse, controlled by one lever, and can be operated without danger of stripping the gears, as it can be thrown from one speed to another without going through the third or neutral gear.

The runabout weighs 550 pounds complete, and is equipped with 5-horsepower 2-cylinder four-cycle motor of 3 x 3 bore and stroke, air-cooled, and placed under hood. The ignition is jump spark and the carbureter float feed. The chassis has a wheel-base of 58 inches and a tread of 42 inches, with wooden artillery wheel equipment, and special 2 1/2-inch single tube tires. The direct shaft drive is used, the axles are fitted with roller bearings throughout, and hub brakes are supplied. The style of the body is the buggy-top type, and the price of the outfit \$375.



GASTON PLANTIFF, IN THE NEW SIX-CYLINDER FORD.

FROM NEWARK TO LAKEWOOD, N. J.

NEWARK, N. J., April 23.—Trips to Lakewood have been much discussed among the local automobilists. The journey is easily made via Elizabeth and Menlo Park. Crossing the railroad tracks at the latter place to the north roadway, continuing along to Metuchen, thence over the Raritan river bridge into New Brunswick, after leaving New Brunswick follow up the steep hill to the Old Bridge, then take the left fork of the road beyond the bridge to Mt. Pleasant railroad station, then to Freehold, and on to Turkey, Farmingdale, to Lower Squankum, where the middle fork is taken for Lakewood.

NEW OFFICIALS FOR N. Y. A. T. A.

Percy Owen, who was the New York Automobile Trade Association's first president, was again elected to that office, on the retirement of C. R. Mabley, at the recent annual meeting. Mr. Mabley, who has served with such marked success as president for the past two years, declined a renomination. The other officers elected were: Vice-presidents, C. F. Wyckoff and Carl Page; secretary and treasurer, William P. Kennedy.

Mr. Owen, the new president, is Eastern manager for the Aero-car Company, of Detroit, with headquarters in New York City. He was formerly manager of the Winton branch. C. F. Wyckoff, the new vice-president, is president of the Decauville Automobile Company, while Carl Page, the other vice-president, is manager of the White Company's local branch. Mr. Kennedy is consulting engineer for Smith & Mabley.



PERCY OWEN, NEW YORK AEROCAR REPRESENTATIVE.

NEW YORK A LARGE OWNER OF CARS.

It is not generally known even in New York what an extensive owner of automobiles the city of New York is. Although Fire Chief Croker's weird red machine with its shrieking siren and Commissioner Woodbury's car with the big white initials of the Department of Street Cleaning on the radiator are common sights, it comes somewhat in the nature of a surprise to learn that the city now owns twenty-seven automobiles, and, if the requests made by the heads of the various departments of municipal government are granted by the Aldermen and the Board of Estimate and Apportionment, thirteen new ones will be added to the number, bringing the total up to forty, representing an investment of \$125,000. Many of the cars among the present twenty-seven, however, were bought at second-hand and are now obsolete.

Appropriations have already been granted for two new machines each for the presidents of the Boroughs of Manhattan and of Brooklyn, and the purchase of two others, at a cost of \$6,250, for the Commissioner of Bridges, has been authorized but is yet to be approved by the Board of Estimate. The Commissioner of Police has asked for three automobiles, to cost \$16,500; the Commissioners of Street Cleaning and of Docks and Ferries each want two. The Deputy Fire Commissioners in Manhattan and Brooklyn want two electric runabouts.

The Fire Department is now the largest holder of autos, Chief Croker's Locomobile being the most expensive of the five, in cost \$14,250 in the aggregate. Second in the list is the Department of Health, which has four that together represent an investment of \$9,700. The Park Commissioners of Brooklyn and Queens and the President of the Borough of Richmond follow with four each, but of less aggregate cost.

CHICAGO'S FIRE CHIEF HAS AN AUTO.

CHICAGO, April 23.—The city council, upon the recommendation of the finance committee, will purchase the automobile which Fire Chief Campion has been using of late, and an appropriation has been made for that purpose. The chief prefers the machine to a carriage and horse, and he intends to use it day and night. The car is equipped with a large electric fire gong the same size as those used on the fire engines. It is painted the regulation blue, with the running gear in carmine. It has special tires to prevent possible punctures, and is provided with a top which can withstand considerable shocks of falling weights.

President Ralph Temple, of the Chicago Automobile Dealers' Association, is to appoint a legislative committee to make a stand for the rights of automobilists in the city. It is proposed to secure Attorney Jennings, an experienced lawyer, to represent the association in all its cases. It is intended to make a fight against the indiscriminate arrests made of alleged scorchers.

LOOK OUT FOR THIS TRICK.

A bold swindle is reported from Wisconsin, where the Jeffery company is trying to locate the perpetrator of the novel theft. Last fall John Lone, of Lake Geneva, left his Rambler at the Kenosha for an overhauling, with instructions to have it ready for him upon his return from a trip to California. When he came back not long ago he wrote to the factory, asking when the machine would be ready, and was surprised to receive an answer stating it had already been shipped on his order. Prompt inquiry developed the fact that while he was on the coast, some person had gone to the Kenosha shop and asked if Mr. Lone's machine was done, and being told that it was, asked to see it. He then left apparently satisfied, and a day or so later the Rambler people received a letter enclosing a post-office order for \$50 to cover the cost of the repairs and giving directions to ship the machine to Chicago. The name of John Lone was signed to the letter. So the car was loaded into a freight car and sent to South Chicago, where the receiver had signed Lone's name.



MAIN SALESROOM, FIRST FLOOR, NEW LOZIER STORE.

NEW LOZIER HEADQUARTERS.

Located at the corner of Fifty-fifth street and Broadway, the new New York store of the Lozier Motor Company occupies a site of marked prominence in the heart of the automobile district of the metropolis. The ground floor showroom is splendidly lighted from both street sides, as may be seen in the illustration. On the second floor is shown a fine display of Lozier motor boats and marine motors, and the third floor is devoted to the suite of finely appointed general offices of the company, recently removed from No. 1 Broadway. The whole of the fourth floor is devoted to the storage of the stock of extra cars and automobile and motor boat supplies. The commodious basement, which extends under the whole structure, is equipped as a repair shop and outfitting place, with a full complement of electric power and light machinery.



LOZIER MOTOR CO.'S NEW BUILDING ON BROADWAY.

MILWAUKEE TELLS OF SALES.

MILWAUKEE, WIS., April 23.—The advent of spring weather the past week has brought out automobilists in great numbers, and the dealers feel more confident each day that a period of unprecedented activity awaits them. This optimistic view appears to be quite prevalent, and is based not merely on idle speculation but on the large number of orders that have already been booked and on the long lists of prospective purchasers which dealers have in hand. There are now about 500 cars owned in Milwaukee, and it is estimated by those in a position to forecast with more or less accuracy that this number will be doubled during the season of 1906.

That Milwaukee should be included in the category of cities on the automobile map is not at all surprising, for the inducements offered motorists are exceptionally inviting. Primary, among others, are the good roads in the city, as well as those radiating from it which lead to pleasure resorts that bear more than a local reputation. The driveway that is most frequented is that extending along Lake Michigan to Lake Park and thence to Whitefish Bay. This point is a noted resort, and is one of the first about the city to be made the destination of a short trip when an automobilist desires to give his friends a spin over a well kept, smooth course. Lake Park is situated between Whitefish Bay and the city, and is one of the most picturesque breathing spots included in the park system as well as the most attractive to autoists by reason of its splendid drives. The scenery of Lake Park is very attractive, and the natural beauties of the northern end, which have been practically undisturbed, vie with the results achieved by the landscape artists, whose work is everywhere apparent in other sections.

After leaving Lake Park the automobilist may travel along fairly good roads to the extreme western end of the city, where Washington Park is located. It is the largest of the city's parks, and, with its inland lake, wooded tract and deer enclosure, attracts more attention than any of the others. Leading from Washington Park, and passing through Soldiers' Home, is a delightful drive, which has its terminus on the south side, where are located Mitchell, Kosciusko and Humboldt parks. Aside from pleasant drives in and about the city, favorable regulations governing the use of automobiles have served to stimulate the growth of the industry.

During the past year a marked improvement in garages has taken place, and several reliable agencies have sprung up. The list of cars handled will undoubtedly meet the demands of the most discriminating buyers. It includes the Peerless, Winton, Pope-Toledo, Rambler, Stoddard-Dayton, Pierce Great Arrow, White, Studebaker, Ford, Packard, Reo, and several others.

GOOD SEASON IN CINCINNATI.

CINCINNATI, April 23.—The automobile season is opening well here and all the dealers are reporting sales every day. Because of the city's many hills, many of the new cars are of the powerful and expensive makes, such as the Winton, Packard, Pope-Toledo, Locomobile and Thomas, while there is also a fair demand for the Buick, Franklin, Olds, Ford, Orient, Compound and Autocar. Some of the dealers have already sold their allotments of cars and are now laying plans for next season.

The Cincinnati Omnibus Company is about to erect the largest stable for horses and buses ever contemplated in this city. It will be 133 feet on Sixth street, 183 feet on Carlisle avenue, with a depth of 175 feet and four stories high. Automobilists regard this as a step backward; but as yet none of the motor truck or omnibus people have been able to convince this company that motor cars are better than horses.

Schumacher & Boye, manufacturers of machine tools, have just purchased five Orient touring cars for the use of the officials of the company.

Intending buyers of automobiles in New Zealand are awaiting the New Zealand International Exhibition, in the expectation that up-to-date models will be displayed there.

TOLEDO REPEATS AN OLD STORY.

TOLEDO, O., April 23.—The Coliseum Garage Company, organized with \$75,000 paid-up capital, has purchased the Coliseum property and will convert it into a first-class garage, patterned after those of the French capital. The Coliseum was built as a roller skating rink, but owing to the fad dying out in this city the building became a white elephant, though now it promises to become one of the best paying properties in the city. Of such proportions is the building that between 200 and 300 machines can be comfortably stored; this, also in view of the fact that a large number are to have private stalls which will require more room than otherwise. The company will devote its energies entirely to the garage business and will not break into the repair field at all. Its location is almost in the center of the residence part of the city, and inasmuch as the members of the company are all automobile owners and operators, aside from being prominent society people, success ought to crown the efforts of the concern from the start.

It is indeed difficult to appreciate the wonderful strides which have been made in Toledo during the past year in regard to the automobile business. About eighteen months ago, when the writer took a census of the number of machines in Toledo, he found not to exceed 235. Yesterday he inquired of a number of automobile people as to the number now in the city. In every instance, while they differed somewhat, the answers were surprising. It was estimated that there are now between 1,500 and 2,000 machines in the city of Toledo. This is a growth of not far from 1,000 per cent. in less than two years, and while garages have been springing up with mushroom rapidity, they have not been keeping pace with the increased number of machines.

As the result of a municipal junket to Cleveland, the members of the board of public service may invest in a number of municipal automobiles. Cleveland maintains machines for the use of its city officials, and the local "city dads" think well of the idea. They believe that the automobile is a time saver as well as a street car fare reducer. Ever since the local street car company has been doing business, it has been furnishing free tickets to city officials, but when the present Independent force was elected it began a reform movement and decreed that no employee of the city should accept tickets from the company, and it has since been paying for the tickets used by its employees while attending to business for the city. The item is considerably larger than was anticipated when the reform bug was at work, and now the public servers are beginning to think that perhaps an automobile or so would help reduce the current expenses along this line, as well as afford a little more of a metropolitan air about the city hall.

A NEW HAMPSHIRE CITY'S TRADE.

PORTSMOUTH, N. H., April 14.—Judging from the frequency with which new automobiles are arriving for local owners, the trade is in a flourishing condition in Portsmouth and vicinity this spring. Twenty new cars, at least, will be added this summer to the list of those carrying local registry. The Olds, Cadillac and Maxwell cars are the ones chiefly in use here.

There is, as yet, no automobile club formed here; but present indications would seem to warrant the assurance of one in the near future.

The only law governing the speed of automobiles in this city is an ordinance equally applying to horse-drawn vehicles, which permits no speed in excess of eight miles an hour through the city proper. A law to the same effect is in force in the towns.

OLDFIELD'S RUN 'TWTXT TEXAS TOWNS.

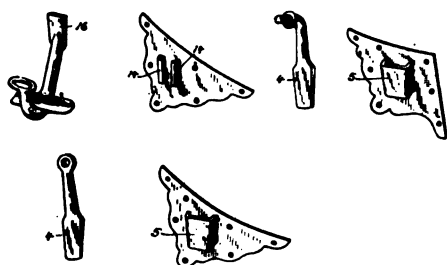
AUSTIN, TEX., April 19.—Barney Oldfield made a record-breaking trip in his Peerless touring car to-day. Leaving San Antonio promptly at 12 o'clock, he drew up in front of Driskill's Hotel at 3.15 o'clock, breaking all former touring car records between the two cities by 2 hours 30 minutes. He made the trip between two points almost as fast as the regular passenger train.

Patents

Brackets for Automobile Tops.

No. 817,517.—W. C. Rands, of Detroit, Mich.

Instead of having the brackets rigidly fastened to the body, which necessitates disturbing the upholstery and causes an unsightly appearance when the top is removed, the brackets are held by sockets suitably shaped which are permanently fastened to the outside of the body. The sketches show three forms of brackets



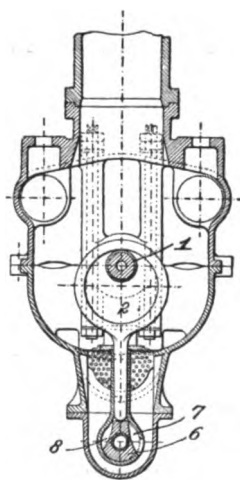
RANDS REMOVABLE TOP BRACKETS.

with their respective sockets, which are tapering and hold the brackets firmly. Socket 14 receives bracket 16, and brackets 44 go into sockets 55.

Oil Pump.

No. 817,630.—L. M. G. Delaunay-Belleville, of Neuilly-sur-Seine, France.

An oil pump for a system of forced lubrication in an automobile motor. The oil at the base of the crankcase descends through a strainer into the oil pocket beneath, which contains the pump. The pump is of the oscillating type, and is operated by the eccentric 2 on the crankshaft 1. It has no check valves, but the intake and outlet are controlled by the



DELAUNAY-BELLEVILLE OIL PUMP.

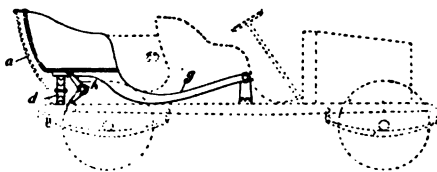
rocking of an extension of the pump barrel on the stationary valve member 6. The intake 7 is put in connection with the pump barrel by a movement of the eccentric to the right, and the opposite

movement establishes connection with the outlet 8, leading to a pipe not shown.

Seat Suspension.

No. 817,682.—O. Werner, of New York City, N. Y.

This is a body construction design to relieve the tonneau passengers of part



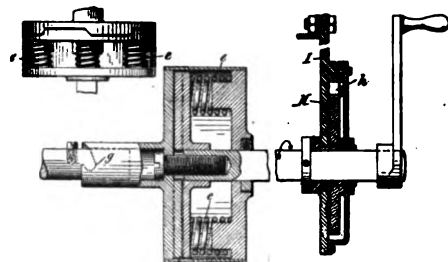
WERNER REAR SEAT SUSPENSION.

of the vibration to which they are ordinarily subjected. The rear seat, instead of being an integral part of the body, is supported on suitable springs, such as the full elliptic spring seen endwise at d. The seat is guided by the side bars g, which are pivoted at their forward ends, and its independent vibrations are dampened by the shock restrainer h. For the sake of appearance, the false back a is added.

Safety Starting Device.

No. 817,266.—J. N. McMillan, of Buffalo, N. Y.

This device engages the crankshaft by the usual ratchet g, and consists essen-



McMILLAN SAFETY STARTING DEVICE.

tially of two parts. The first is a fine-tooth ratchet wheel H fixed to the shaft of the starting crank and controlled by two pawls h, which are supported by the stationary member I. This prevents the starting crank from turning backward beyond the first engagement of a pawl with H. The rest of the device is a clutch (seen in plan in the detail) which automatically releases when the torque exceeds that required to overcome the compression. In case of a back kick, the springs e compress, and the notched disks slip past each other.

Lifting Jack.

No. 817,637.—W. E. Gaston, of Pleasantville, N. Y.

A screw jack having a nut revolved by a worm and crank and resting on ball bearings. The lower end of the screw descends into an elongated grease cut, which completely incloses it.

Treating Nickel-Iron Storage Batteries.

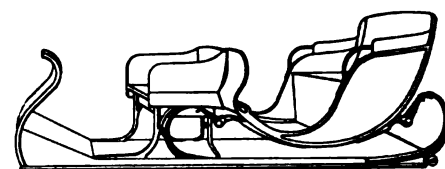
No. 817,162.—T. A. Edison, of Llewellyn Park, N. J.

The inventor states that a loss of capacity sometimes shown by these batteries has been found to be due to the fact that when the cells are shipped without electrolyte in a partially charged condition, a portion of the finely divided iron oxidizes in transit. To overcome this difficulty the iron is completely oxidized by a reversing current before the battery is shipped, thereby making further oxidation impossible.

Carbureter.

No. 817,641.—C. B. Harris, of Wilmington, Del.

A simple float-feed carbureter, having a horizontal tubular spray chamber and



ATWOOD AUTO BODY DESIGN.

inclined spray nozzle rising above the middle of the spray chamber. A baffle plate is placed across the upper part of the spray chamber just before the spray nozzle, to deflect the air stream downward, thereby assisting it to evaporate in liquid gasoline that may fall from the spray nozzle.

Body Design.

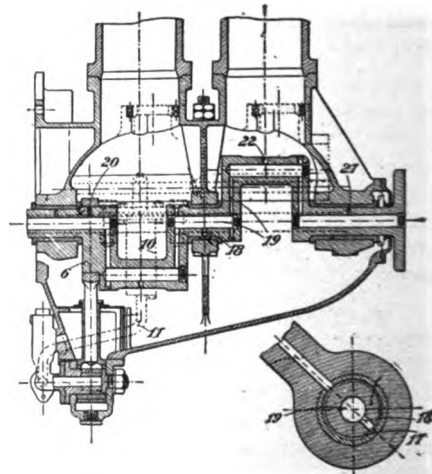
No. 37,952.—W. H. Atwood, of New Haven, Conn.

The ornamental body design shown.

System of Forced Lubrication.

No. 817,629.—L. M. G. Delaunay-Belleville, of Neuilly-sur-Seine, France.

This system of oil circulation used in connection with the pump shown in No. 817,630. The oil from the pump passes through pipe 11 and strainer 10, and is delivered through passages to the main



DELAUNAY-BELLEVILLE LUBRICATION.

bearings. Besides lubricating these, a portion of the oil enters the crankshaft by grooves 17 and drilled holes 18 (see detail) and 21. Thence it travels by oil passages 19 and holes 22 to the crankpin bearings.

THE GROWING GARAGE LIST.

The Woodlawn Auto Station has been opened at 6310 Wodlawn avenue, by F. Ebann. It is in a new two-story brick building.

The Allegheny Automobile Company, of Pittsburg, has opened a garage in Jackson street, Allegheny, and will handle the Queen car.

A large garage, with an inclined runway to the second floor, is being erected in Portland, Ore., by Cook & Covey, at Burnside and Fifteenth streets.

Le Roy Mansfield, of Richmond, Ind., is reported to have looked the situation over in Connersville, Ind., with a view to establishing a garage there.

In Beatrice, Neb., Fred Bowman is to erect a garage adjoining his livery stable opposite the Union railroad station. It will be 60 by 70 feet in dimensions and have a stone front.

The private stable of James R. Roosevelt, Jr., at 241 West One Hundred and Seventh street, New York, has been leased for a number of years to V. W. Kliersath, to be used as a garage.

Manager C. J. Heine, of the Elgin Automobile Co., has arranged to establish a garage in the vacated building of the Elgin Grocery Co., in Elgin, Ill., to be run in connection with his business as local agent for the Buick cars.

A three-story stable at 1722 Broadway, owned by Mrs. Lillie McGovern, is to be enlarged and reconstructed into a garage for J. Michaels, as lessee. A three-story fireproof extension is to be added; the improvements costing \$8,000.

A handsome and commodious garage and salesroom for Leon Bollee cars has been opened in New York City, at Park avenue and Sixty-third street, by Cryder & Co., who announce their ability to make immediate deliveries of chassis and cars fitted with bodies.

Quarters have been secured at 911 Nicolet avenue, Minneapolis, by the Minneapolis Auto Company, which has taken the agency for Austin cars. The company will conduct a repair department and carry a full line of sundries and supplies. Manager Douglass is one of the most experienced automobile repairmen in the city.

The Bronx Auto Garage Company is erecting a new garage on the Boston road at Crotona avenue, near 171st street, the Bronx, New York. It is to have 20,000 square feet of floor space and will be ready to occupy next month. The company is now occupying temporary quarters in an old frame stable opposite Morris High School, on the Boston road.

L. G. Martin has moved into his new garage at 3923 Forbes street, Pittsburg, but will also maintain his former establishment at 3994 Forbes street. The new garage is a brick structure 127 by 40 feet in size.

As agent for the Rambler cars, he will have an allotment of seventy-five of these machines for disposal this season, of which one-third has already been sold.

Application is to be made on May 7 to the governor of Pennsylvania for a charter for a company to be called the Matthews Motor Company, which will conduct a salesroom and repair shop for automobiles and auto boats in Philadelphia. The incorporators will be Louis I. Matthews, J. Morris Wistar, Dillwyn Wistar, Craig Heberton, George H. Jones and A. D. M. Smith.

The Raisin City Garage has been opened in Fresno, Cal., at 940 to 946 I street, opposite the Hughes Hotel. It is under the management of F. A. Dustin, who will operate an auto livery service in addition to conducting a regular storage and repair business. In connection with the garage M. B. Shipp will have on sale the Pope-Tribune, Pope-Hartford and Pope-Chase line of cars.

Contract has been let by George Schemmel, of Wapakoneta, Ohio, for the erection of a garage building that will be fireproof and large enough to accommodate half a dozen touring cars and a dozen runabouts. Work is to be pushed as rapidly as weather will permit. The garage will be open day and night, a competent repairman employed and a full line of sundries and supplies carried in stock.

The Colonial Automobile Company, of Pittsburg, has been granted a Pennsylvania charter and has secured a site at 5518-5520 Walnut street, Shadyside, on which it will erect a brick and concrete fireproof garage. The building will have no posts and will be equipped with plunger elevators. The company has a capital of \$25,000, which will shortly be increased to \$50,000. A complete repair shop and power plant for charging electric cars will be provided.

A two-story garage and office building is nearing completion at 44-46 West Adams street, Jacksonville, Fla., to be occupied on the main floor by Robert Neims, who has heretofore conducted a large bicycle business on Main street. The building will measure 42 by 75 feet and will have a machine shop in the rear 25 by 30 feet. The first floor is of cement, with walls faced with white pressed brick, and the ceiling is of pressed steel. The main room will accommodate thirty cars.

Several of the stockholders in the Studebaker Brothers Automobile Company are interested in the South Bend (Ind.) Automobile and Garage Company, which has been incorporated with \$5,000 capital to conduct salesrooms and garages in South Bend. The Studebaker cars will be handled. The Barger garage, recently purchased, will be operated as part of the company's system. The directors and incorporators are: Harry D. Johnson, E. Louis Kuhns, George M. Studebaker and Nelson J. Riley.

PUBLIC SERVICE LINES.

SYRACUSE, April 23.—In the city of Watertown, containing 25,000 inhabitants and situated eighty miles northwest of Syracuse, Chauncey W. Gray is to try the experiment of an automobile omnibus line. This is being watched with considerable interest by the trade in this section. Watertown and its environs often have very severe winters and there is much speculation whether the projected line can give adequate service during the bad months. Mr. Gray is confident, however, that he will have no trouble in this respect.

He has already received two cars and will have more. He expects to have the service operating capably by the end of April.

The smaller car will hold from fourteen to eighteen persons. It is closed and has rear entrance. The second car will seat twenty-four persons and is designed after the pattern of an open street car, with cross seats and canopy top. Both cars are Panhards.

Sightseeing Cars for Twin Cities.

ST. PAUL, April 23.—Plans have been made for the establishment here of a sightseeing service which shall embrace Minneapolis and many points of interest in the vicinity of the Twin Cities. The service will be conducted by the American Sightseeing Car and Coach Company. W. E. Bridgeman, representing the company, has been in the Twin Cities to look the field over and has selected one of the leading St. Paul hotels as headquarters. A bureau of information will be established, and it is expected to have the service in operation by May 1. Six new automobiles will be shipped to St. Paul to start the system with, and if the venture proves successful more will be added. The St. Paul Commercial Club is co-operating with the company in the matter.

Public Cars for Toledo.

TOLEDO, April 23.—The Toledo Auto Touring Company has been organized by former city officials under the Republican régime. John Stolberg, former president of the Board of Public Service, is president and Frank Van Loo, former street commissioner, is general manager.

The company is having several touring cars built for its special use. They will seat from ten to twenty persons and will be devoted entirely to sightseeing about Toledo and the adjacent territory. The first of the cars will be delivered June 1.

Plans are being made for the establishment of an automobile stage line between Escondido and San Diego, Calif.

A twenty-passenger automobile has been placed in operation between Sanford and Orlando, Fla., twenty-two miles apart. The car meets the Clyde line boats at Sanford every day.

NEWS AND TRADE MISCELLANY.

The Ottawa Garage and Cycle Company, of Ottawa, Ill., has closed with the Buick people to handle that car in their vicinity.

A sub-agency has been established in Brooklyn by the New Amsterdam Motor Company, metropolitan agents for the Crawford line.

A Haynes local branch has been established at 241 Wabash avenue, Chicago. The main city headquarters will remain at 1430 Michigan avenue.

The McDuffy Auto Company, of Milwaukee, Wis., is enlarging its garage on Wisconsin street, that city, and expects to have the work completed by May 1.

An interstate horse and automobile show is to be held in Rutland, Vt., on June 5 and 6 for the benefit of the Rutland Hospital. R. W. Goodrich, of Rutland, has been elected president.

The Grand Forks Automobile & Garage Company, of Grand Forks, N. Dak., has been appointed agent for the Cartercar. Its territory embraces the eastern half of the State.

The Hickman, Kraemer & Croll Co. has been organized in Milwaukee to handle the friction-drive Cartercar for the State of Wisconsin and the upper peninsula of Michigan.

The Philadelphia agency for the Dorris car, made by the Dorris Motor Car Company, of St. Louis, has been secured by L. M. McComb, with salesroom on South Broad street.

The Aerocar Company, of Detroit, Mich., announces that daily shipments of cars are now being made from the factory, and that agents or individual purchasers are assured of prompt delivery.

Igou Brothers, successors to the Krotz Manufacturing Company, of Springfield, Ohio, have removed their shop to the corner of Ninth and Center streets, that city, where the business will be continued.

All of the new Mercedes six-cylinder racing cars, several of which are to compete in the next Vanderbilt Cup race, are without exception to be fitted with the Eisemann high-tension magneto, according to authoritative information received.

A three years' contract for the American agency for Brasier cars has been closed by E. B. Gallaher, 228-230 West Fifty-eighth street, New York, who is representing the car at the present time. A. H. Chadbourne, who represented Mr. Gallaher in making the new contract, sailed from France for home on April 14.

Jerry Ellis, in a four-cylinder Frayer-Miller, and Paul Henderson, in a 26-28-horsepower Oldsmobile, made non-stop runs in Chicago recently. Henderson traveled 100 hours without stopping. The car used 85 gallons of gasoline and 3 1-2 gallons of oil. It traveled 1,115 miles in all. The Frayer-Miller continued for 60 hours.

A company recently formed in Joplin, Mo., by A. C. Webb has been incorporated with \$15,000 capital. The new quarters of the company will be fitted up so as to make them among the most complete in the Southwest. The stockholders are George Playter, A. C. Webb, H. G. Packer, W. P. Lytle, John Edmonston and Lew Ballard.

The Southern Automobile Company, of Nashville, Tenn., has decided to enter the manufacturing field of commercial vehicles and has commenced operations in a plant

located in the old Broad Street Amusement Hall, that city. J. H. Lawrence, who has held the position of mechanical engineer at Vanderbilt University, Nashville, will occupy a similar position with the new factory.

Lasalle & Kock, of Toledo, one of the largest dry goods firms in the Middle West, have decided to abandon the horse and wagon as a means of delivering goods, and have increased their automobile delivery service recently by installing special motor tricycles. Each tricycle has a parcel carrying capacity of seventeen cubic feet. So far as these machines have now been tried they have proved popular.

A new automobile company, which will probably be known as the Marvel, is being incorporated in Des Moines, Iowa, with \$25,000 capital, to start the building of automobiles in a factory that may be located at East Fourth and Vine streets. The cars to be constructed will follow the designs of the Marvel automobile built last year by Fred Dusenberg. The largest stockholders will be Mr. Dusenberg and E. R. Mason.

Among prominent purchasers of Rainier touring cars during the past week in New York City are T. Suffern Tailer and Paul Tuckerman, of Tuxedo, both of whom bought 35-horsepower machines, and W. W. Heaton, Jr., Marcus Mayer, Julius Siegbert, J. T. George, L. G. Salter, P. Rosenheim, Harry L. Scheurmann and J. B. Lorge. The Rainier Company delivered fourteen cars to customers during the week.

Public notice has been given in Philadelphia of the intention of the Auto Transit Company of that city to apply to the Governor for a charter to own and operate lines of omnibuses propelled by electricity, gas, compressed air or other motive power on the city streets and county roads of the State. The application will be signed by Charles Berg, James O. G. Duffy, Charles F. Perce, Bernard A. Cassidy, John R. Criswell and Joseph Ledwinka.

The Allegheny Country Club of Sewickley, Pa., one of the leading social organizations of Pittsburgh, has ordered from the Standard Automobile Company a twenty-passenger Manhattan bus to transport the members from Sewickley station to the clubhouse on Sewickley Heights, two miles away. The car is of the cross seat pattern, 153-inch wheel base, and has four cylinders, water cooled engines which will develop about 45 horsepower. It weighs 6,000 pounds and will make the trip up the hill with a full load at the rate of 15 miles an hour.

Fifty-six miles over rough roads and up hill all the way in less than two and a half hours is the new auto record established between Cripple Creek and Colorado Springs, Colo., by L. G. Carlson, banker and mining man. The trip was made in the new 30-horsepower Winton recently purchased by Mr. Carlson. Having missed the regular train and being obliged to go Cripple Creek to close an important mining deal, he was compelled to make the trip in his machine. The big car started fifteen minutes later than the train and beat it into the city.

Arthur J. Wills, a tire expert, of Akron, Ohio, writing to the Winton Motor Carriage Company on the care of automobile tires, says: "The best thing to guide an owner of an automobile in the proper inflation of his tires is to have them inflated sufficiently so that when the car is loaded with passengers the weight will

not cause the tires to bulge out on the sides but slightly. If the bulge is prominent and causes the tire to flatten out, riding it in this way will have a tendency to strain and weaken the fabric and blow-outs will be more liable to result."

Announcement is made that when the Buick Motor Company removes from Jackson to Flint, Mich., in the fall, the enterprise will be continued by a new company. The Durant-Dort people will be associated with the Jackson business as well as with the Flint enterprises. Additional capital will be provided and, instead of Jackson losing its greatest and best factory, it is hoped that it will be continued on a greater scale than before. The Durant-Dort people will occupy the factory and local capital will be interested in the new automobile concern. There is plenty of business for both the Flint and Jackson factories, and plans for the organization of the new company are already under way.

The Excelsior Automobile Supply Company and the Continental Caoutchouc Company have opened new retail supply stores at 1436 and 1438 Michigan avenue, respectively, in the heart of the Chicago automobile row. Besides a full line of Continental tires, the Continental company carries a full line of tire supplies and accessories. It also has one of the most up-to-date vulcanizing and repair plants in the city. The interior of both stores is finished in weathered oak, Mission style, and there is every facility and convenience for the prompt purchase of goods. The showcases are lighted by means of shaded electric lamps, in which the names of the different well-known automobile specialties are inserted in translucent red letters.

The opinions and ideas of any man in the factory are encouraged by the management of the Thomas plant, in Buffalo, and suggestions are constantly being referred to the expert designers from men in the engine, transmission, assembling and other departments. Thus is obviated one of the dangers of the practice of employing only one expert designer, who is likely to have or develop certain hobbies or notions to which he will stick no matter how antiquated or commercially undesirable they may be. Where every man may make his suggestions and every suggestion is threshed out thoroughly, there is no chance of this. It is found that the new practice makes the men more alive to their chances, gives a better opportunity for individual efforts, and in the end brings about much better general workmanship than otherwise could be obtained.

The Rossel Company of America, sole agent in the United States and Canada for the sale of F. Rossel & Cie's automobiles, made in Sochaux-Montbéliard, France, has just opened an office in the Knickerbocker Building, Thirty-ninth street and Broadway. The company is incorporated under the laws of the state of New York with a capital of \$100,000. Harry N. Fletcher, of Hoboken, N. J., is president; Francois Rossel, of Sochaux-Montbéliard, France, is vice-president; William S. Ottman is treasurer, and Count Manuel de Caserta, of Paris, is secretary. Charles M. Eaton and Eugene N. Robinson, of New York, are also directors. The manager is William P. S. Earle, who was formerly with the New York branch of the White company. The Rossel company makes four sizes of motors: 22-26 horsepower, 28-35 horsepower, 40-50 horsepower and 50-65 horsepower.

INFORMATION FOR BUYERS.

THE LEA SPEEDISTIMETER.—This speed recorder combines in a beautifully finished, moisture proof, polished brass or nickel case, three distinct instruments—a season and trip odometer, speed indicator and an 8-day full jeweled clock movement. It is mounted on the dash and is driven by the wheel of the automobile, to which it is connected by means of a woven steel wire flexible shaft encased in polished brass flexible steel tubing. While the speedistimeter is a combination of three separate instruments, it is so built that each unit is relatively distinct from all others.

The speed indicator section is actuated by centrifugal force and the application is similar in many respects to the well-known German tachometer. The main shaft runs on ball bearings, and traverses the instrument on the vertical plane, thus transmitting the motion to the needle without the use of bevel gears. The odometers are two in number, the season reading to 9,999.9 and the trip to 99 miles, the latter being equipped with a set-back. The gears actuating the dials are cut and substantially mounted, forming

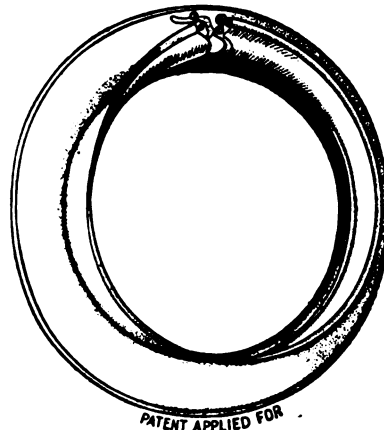


LEA SPEED AND MILEAGE REGISTER.

an integral part of the instrument. Each chain of gears is protected from jamming or back-lashing by means of roller cams. The clock movement is of Chelsea make, 8-day and 7-jeweled, with 21-4-inch face. Attachment fixtures consist of saddle for spanning steering knuckle, a bracket for ball bearing pinion and distance rod fitted with two ball and socket connections, and they are practically universal, so that they can be fitted to any car. The Lea Speed Meter is the above instrument without the clock. This line is manufactured by the Motor Car Specialty Company of Trenton, N. J., and marketed by William S. Jones, 112 North Broad street, Philadelphia.

TEEL TIRE COVER.—Owners of cars fully appreciate the importance of a quickly adjusted waterproof tire case, and the one shown in the illustration, manufactured by the Teel Manufacturing Company, of Medford, Mass., is the latest novelty shown in this line. The makers' claims, as set forth in a circular just

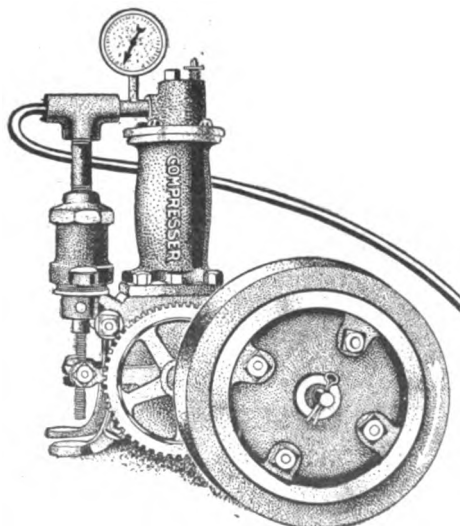
issued, embrace practicability, first-class material, waterproof and dustproof qualities, and ease of application. The case is



TEEL WATERPROOF TIRE CASE.

held in place on the tire by two steel wires instead of by the usual method of lacing.

AUTOMOBILE AIR BRAKE.—The Kalisch Air Brake Company, of St. Louis, Mo., has opened up its new works and main office at 1315-17 Chestnut street, that city, for the purpose of producing its new automobile air brake, which consists of four separate parts—automatic compressor, operating valve, storage tank and cylinder. The compressor is of the regular upright splasher type, mounted on adjustable base, on which is mounted a friction paper pulley geared down to overcome the resisting compression. The pulley is mounted on the crankshaft by means of two rocker arms, so that same moves from center, and on one side of the compressor there will be noticed an adjustable spring, on the other side a small cylinder which acts as governor. When the desired pressure in the tank is reached, the air in this cylinder overcomes the adjusted spring resistance and automatically brings the pulley out of engagement from flywheel. When the air is used for braking or other purposes the spring overcomes this cylinder pres-

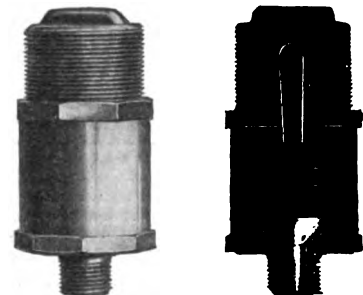


KALISCH AIR COMPRESSOR FOR BRAKES.

sure and instantly brings the pulley into engagement again. The crankshaft of this compressor is made of two heavy disks which act as balance wheel, connecting rods are made of phosphor bronze and the piston is made from highest grade gray iron with three steel expansion rings.

The operating valves are of the three way type, made of the highest grade steel tested air-tight at 1,000 pounds, finished in nickel. The tank is made of the best pressed steel tested to 500 pounds pressure, is neat in appearance and may be mounted in any suitable place in the car. The cylinder is made of gray iron fitted accurately at 250 to 2,000 pounds pressure on the piston, and tested at 50 pounds to the square inch, and can be readily attached to the brake rods. The whole equipment weighs complete but eighteen pounds for the No. 1 size and twenty-three pounds for the No. 2.

PHILADELPHIA GREASE CUP.—This cup feeds automatically by compressed air, and whether the grease be under the air compression an hour or a week, it is claimed the compression is not affected, owing to the air-tight qualities of the cup and its adjusting locknut. The pressure in the cup is never quite exhausted, so that the tendency for the grease to exhaust into the bearing is constant. The illustrations show external and internal views of the novelty. The air is compressed in the chamber shown between the two white lines in the right-hand cut, the lower line being a movable disk,



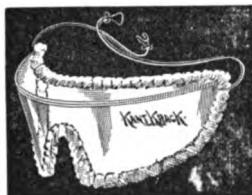
PHILADELPHIA GREASE CUP.

to which is attached the curved wire shown, to hold it in place. This wire is kept in position by the disk-shaped bracket shown by the upper white line, and which is soldered to the inside of the air-chamber. The lower part of the cup, shown below the movable disk, is filled with grease, which passes out the nozzle under the compression, which is regulated by screwing the upper part of the cup into the base, and locking with the octagonal nut shown in the left-hand cut. At the base the funnel-shaped outlet is perforated at its lowest point to permit a complete emptying of the cup. The Philadelphia Lubricator and Manufacturing Company, 1525 Land Title Building, that city, are the patentees and makers.

HARBURG TIRE.—The sole importers for the North American continent for this famous German product is the Harburg Tire Company, 232 West Fifty-eighth street, New York City. For the past dozen or more years the great rubber factories at Harburg, Germany, have been producing tires, and for the past four years the type of automobile tire, which bears the name, and which has achieved a great reputation in Europe, and elsewhere. The tire is of the

clinker type, the tread being particularly tough, and an integral part of the shoe, so as to obviate blistering. The inner tubes are what are known as "heavy" in trade parlance, their heaviness being due to the amount of pure gum used, according to the statements of the manufacturers. Sixteen sizes are catalogued ranging from 28-inch to 36-inch, and shoes are recovered in 26 different sizes, from 26 to 44 inches.

MICA GOGGLES.—Of Parisian design, and made from clearest mica, Kant-Krack goggles, manufactured by the North Carolina Mica Company, of 80 North street,



KANT-KRACK MICA GOGGLES.

Boston, Mass., are making a strong bid for public favor.

The advantages claimed are lightness and non-breakable qualities, and ease in cleansing. They can be worn over eyeglasses, and each pair of goggles comes packed in a neat leather case. They afford the widest possible range of unobstructed vision.

NEW TRADE PUBLICATIONS.

TEEL MANUFACTURING COMPANY, Medford, Mass.—New folder describing specialties made by this house of rolling front celluloid mud and rain shields, wind shields, cape tops, tire covers, brass monograms, dust covers, trunks and racks, spring suspensions, etc.

MANUFACTURERS FOUNDRY COMPANY, Waterbury, Conn.—Two pamphlets, one of small size showing halftone reproductions from photographs of many styles of gasoline engine cylinders of intricate form sectioned to show the remarkable accuracy of the castings made by this company, and the other of larger size showing photographs of the different departments of the foundry.

LIGHT MFG. & FOUNDRY Co., Pottstown, Pa.—Intricate castings in aluminum are presented photographically in an interesting little book called "Aluminum Castings," in which are also shown interior views of the Light company's Pottstown foundry and machine shop. Samples of the work shown include principally automobile engine bases or crankcases, gear-boxes, and clutch parts, all cast in aluminum, manganese bronze, or phosphor bronze. Some interesting facts regarding these metals are contained in the booklet.

THE ARIEL COMPANY, Bridgeport, Conn.—Catalog expounding the merits of the Ariel cars—the cars with the oval radiator—and illustrating the mechanical features such as the 28-30 horsepower engine having the four cylinders cast separately and having inlet and exhaust valves mounted

in the globular heads at an angle to each other, and operated by rocker arms and a camshaft passing across the centers of the heads. The three-speed transmission gear-case is carried in a cradle below the main frame, and the crankcase is cigar-shaped. The weight of the car is about 1,900 pounds.

FOREST CITY MOTOR CAR Co., Massillon, O.—Small catalogue giving illustrations and specifications of the Jewell runabout and stanhope, Models B and C; also brief instructions for operating and a list of "Don'ts." One full-page halftone of the chassis in plain view shows a single-cylinder two-cycle 8-horsepower engine, mounted horizontally under the rear of the body, planetary transmission, side chain drive from countershaft, channel steel frame, three-point suspension on full elliptic springs, tiller steer and side lever control. Regular equipment calls for cushion tires on 32-inch wood wheels; tread is 46 inches and wheelbase, 60.

NEW YORK AND NEW JERSEY LUBRICANT Co., New York.—A new booklet, entitled "Survival of the Fittest Lubrication," has just been issued that contains many thoughts of real value and importance to every buyer of lubricants, and every man responsible for the economical and uninterrupted operation of machinery. This concern is the maker of Non-Fluid oils, which, as the new book explains, does not mean grease, but just what it says—non-fluid oils—which are such the same as snow and ice are non-fluid waters, but in the case of the oils the metamorphosis is a chemical rather than a physical one.

INDEX TO ADVERTISERS

Acetylene Gas Illuminating Co.	31
Acme Motor Car Co.	80
Add-Wear Tire Sleeve Co.	38
Aerocar Co.	92
Am. Anti-Puncture Tire and Auto Co.	35
American Ball Bearing Co.	36
American Battery Co.	54
American Coll. Co.	31
American Generator Co.	38
American Motor Truck Co.	35
American Veneer Co.	41
Anderson Forge & Machine Co.	32
Archer & Co.	31
Artizan Brass Co.	48
Aster Co., L.	52
Atwood Mfg. Co.	31
Auburn Automobile Co.	79
Audel & Co.	50
Auto Pump Co.	34
Auto Rebuilding Co.	50
Auto Safety Starting Crank Works.	30
Automobile Equipment Co.	34
Automobile Supply Co.	35
Badger Brass Mfg. Co.	57
Baker Motor Vehicle Co.	80
Baldwin Chain Mfg. Co.	32
Bates Forge Co.	32
Beaver Mfg. Co.	64
Bemus, T. Alton.	40
Bentley, Joseph.	34
Beverley Mfg. Co.	32
Biddle & Smart Co.	Cover
Blasler Mfg. Co., M. E.	34
Boker & Co., H.	31
Boston Mechanical Co.	37
Bowser & Co., S. F.	63
Boyle & Co., John.	53
Briscoe Mfg. Co.	32
Brownell-Trebert Co.	44
Buckeye Mfg. Co.	85
Buckeye Jack Mfg. Co.	55
Bullard, J. H.	38
Buob & Scheu.	34
Byrne-Kingston Co.	51
C., B. & Q. Ry. Co.	43
Cadillac Motor Car Co.	81
Capitol Foundry Co.	32
Carlyle Johnson Machine Co.	Cover
Carr, F. S.	34
Central Body Co.	37
Central Garage.	35
Chalfonte Hotel.	53

Champion Co., A.	30
Champion Mfg. Co.	33
Chandee & Chandee.	45
Chase & Co., L. C.	40
Chelsea Clock Co.	30
Chicago, M. & St. P. Ry.	53
Cleveland-Canton Spring Co.	54
Collins & Sons, G. A.	34
Connecticut Tel. & Electric Co.	67
Continental Caoutchouc Co.	71
Continental Motor Mfg. Co.	35
Coops Co., C. W.	34
Corbin Motor Vehicle Corporation.	87
Coreoran Lamp Co.	57
Covert Mfg. Co.	33
Crawford Automobile Co.	79
Crucible Steel Casting Co.	32
Cullman Wheel Co.	32
Daimler Mfg. Co.	88
Dayton Electrical Mfg. Co.	56
Dayton Motor Car Co.	83
Deere-Clark Motor Co.	80
Diamond Chain & Mfg. Co.	32
Diamond Rubber Co.	73
Dietz, R. E.	50
Diezemann Shock Absorber.	55
Dixon Crucible Co., Joseph.	44
Dolson Automobile Co.	90
Dorris Motor Car Co.	79
Dover Stamping & Mfg. Co.	30
Dow Portable Electric Co.	35
Duquesne Construction Co.	31
E. H. V. Co., The.	78
Eclipse Buggy Co.	34
Edmunds & Jones Mfg. Co.	31
Eldredge Electric Mfg. Co.	30
Electric Rubber Mfg. Co.	35
Electric Vehicle Co.	78
Electrical Mfg. Co.	31
Elmore Mfg. Co.	39
English Daimler Co.	89
English & Mersick Co.	30
Erle Railway.	52
Excelsior Supply Co.	30
Fairmount Engineering Works.	35
Fedders Mfg. Works.	32
Fisher Automobile Co.	66
Ford Motor Co.	88
Forest City Motor Car Co.	89
Franklin Mfg. Co., H. H.	35
Franklin Portable Crane & Hoist Co.	38
Fremont Mitten & Glove Co.	33
G & J Tire Co.	74 and Cover
Garage Equipment Co.	31
Garford Co., The.	39
General Electric Co.	56
Gibson House.	53
Gilbert Mfg. Co.	64
Glover, George E.	81

Goodrich Co., B. F.	69
Goodyear Tire & Rubber Co.	72
Gramlich Chemical Co.	31
Gray & Davis.	Cover
Ham Mfg. Co.	57
Hardy Co., The R. E.	31
Harris Oil Co., A. W.	40
Harrison Wagon Co.	89
Hartford Machine Screw Co.	32
Hartford Rubber Works Co.	71
Hartford Suspension Co.	68
Hassler Co., O. C.	30
Hatcher Auto Parts Co.	55
Havemeyer Oil Co.	30
Hawkins Mfg. Co.	36
Haynes Automobile Co.	86
Healy Leather Tire Co.	72
Heinze Electric Co.	50
Hicks Speed Indicator Co.	60
Hoffecker Speed and Mile Register Co.	42
Hoffman, George W.	31
Holley Bros. Co.	66
Hopewell Bros. Co.	42
Hopson & Chapin Mfg. Co., The.	32
Hotchkiss, P. M.	60
Hydraulic Oil Storage & Distributing Co.	34
Ideal Carriage Washer Co.	54
Imperial Brass Mfg. Co.	36
Iroquois Motor Car Co.	46
Janney, Steinmetz & Co.	32
Jeffery & Co., Thomas B.	91
Jersey Brake Co.	40
Johnson Sporting Goods Co., Iver.	30
Jones Speedometer.	59
Kallech Air Brake Co.	40
Kellom & Co., Chas. F.	31
Kilgore Auto Air Cushion Co.	46
Kinsey Mfg. Co.	33
Kirkman Motor Mfg. Co.	30
Knox Automobile Co.	87
Lafayette Hotel.	52
Leavitt, Gilbert.	30
Lipman, C. E.	36
Lobe Pump Co.	31
Locke & Co.	39
Locomobile Co. of America, The.	79
Logan Construction Co.	37
London Auto Supply Co.	35
Loomis Auto Car Co.	34
Loring, E. J.	34
Lozier Motor Co.	84
M. & M. Mfg. Co.	46
Manhattan Lamp Works.	49
Manhattan Storage Co.	45
Manley Bros., Three.	33
Manley, Chas. H.	67
Manning Mfg. Co.	34

THE AUTOMOBILE

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No. 18

HOW THEY FINISHED AT ATLANTIC CITY.

By A. G. BATCHELDER.

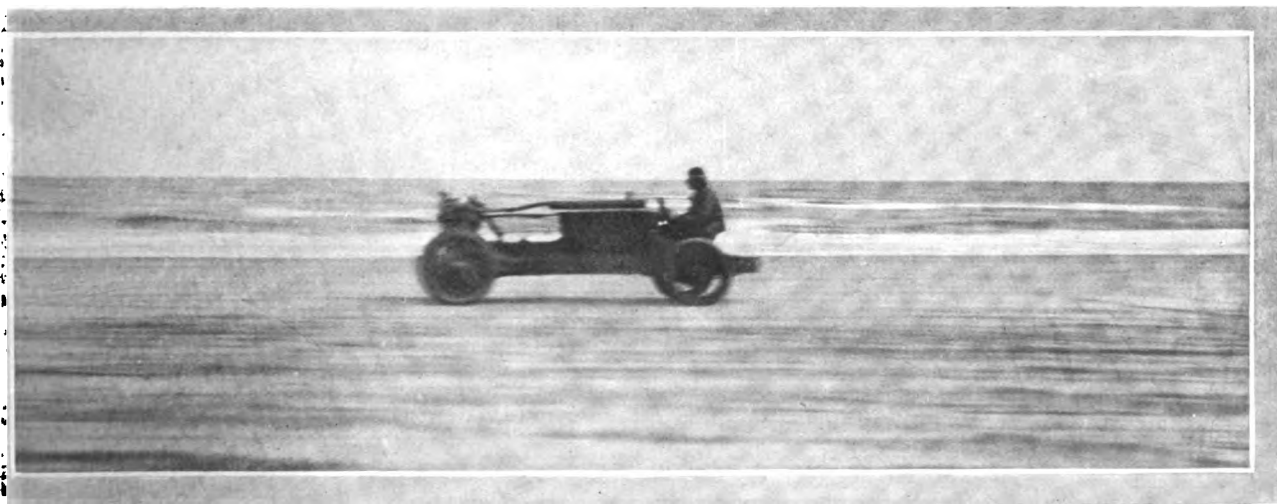
ATLANTIC CITY, N. J., April 27.—When a man has achieved the thing sought, worked for it tenaciously despite one disappointment on top of another, and persisted after friends have lost faith in the idea, the success that comes to him is sweet indeed; and Walter Christie's triumph at the Atlantic City meet figures in this class. Christie and his "Blue Streak" have made a familiar combination at race meets North and South for two years past, and the ups and downs of the even-dispositioned inventor who brought forth the revolving turret used on American warships have been watched by automobilists in general, and particularly by those of an engineering turn of mind.

The "car that pulls instead of pushes" was generously discussed; at times it looked like a failure, and then, again, its future took on a brighter hue, but never for an instant did the persevering Christie doubt the ultimate results of his labor. The encouraging and consistent swiftness of the 110-horsepower flyer on the beach at Ventnor does not positively prove the unquestioned worth of Christie's conception, but the front-drive has now reached a point where its further progress will be observed with added interest, for capital should be easily obtainable looking forward to its practical use in automobiles other than those built for racing purposes.

On the opening day Christie appropriated the one-mile standing-start championship, his mile in 0:53 landing him seconds in

front of the 80-horsepower Napier and the 60-horsepower Thomas. But the battle royal came on Thursday, when Christie tackled the Vanderbilt Darracq driven by Guy Vaughan. The heats of the race meant nothing except to narrow the final down to the Christie, Darracq, and Thomas cars. One false start, and the big fellows pounded over the beach with the Darracq resultlessly in front. Starter Wagner's flag dropped on the next getaway, and the onlookers saw the race of a year. Though the "Blue Streak" held the advantage all the way, it was by a scant margin that figured only two-fifths of a second at the conclusion of the mile. Those who shivered in the penetrating breeze that swept the stretch of sand awoke to the grand struggle and shouted themselves hoarse. The superior horsepower of the "Blue Streak" told the story, but the Darracq had supplied a battle such as one seldom beholds in motor competition.

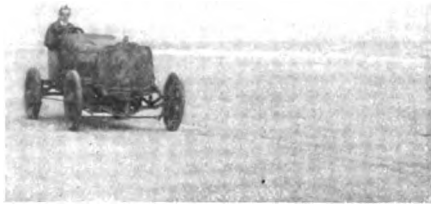
The closing day of the meet saw the surcharged mechanical beasts go after the one-mile record over a course that was much slower than Ormond-Daytona and had one very poor patch of beach, so bad that Christie did not utilize his entire power all the distance. Over the ocean-rolled speedway his powerful craft flew until it deserved well its name of the "Blue Streak," for such it resembled more than anything else. Its mile in 0:35 1-5 was at the rate of 102.27 miles an hour, the fastest world's automobile traveling on any course except the one in Florida.



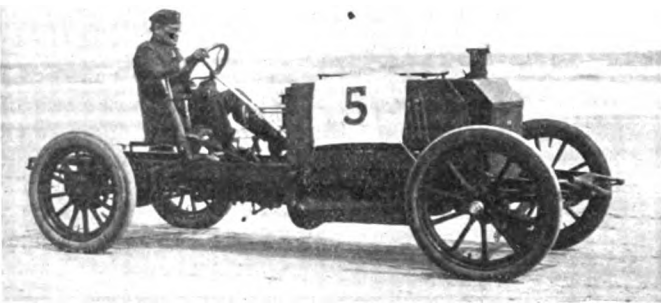
WALTER CHRISTIE DRIVING HIS 110-H.P. "BLUE STREAK" A MILE IN 35 1-5 SECONDS ON VENTNOR BEACH.



THE "BLUE STREAK" WINNING THE FINAL OF THE MILE CHAMPIONSHIP FROM THE VANDERBILT DARRACQ.



C. A. SCHROEDER'S 80-H.P. DARRACQ, W. WALLACE, JR., DRIVER.



W. H. HILLIARD DRIVING THE 80-H.P. NAPIER.

The Vanderbilt Darracq had to be content with a mile in 39 seconds, while C. A. Schroeder's similar powered Darracq, holder of the mile in 0:38 at Cape May, covered the distance in 0:39 3-5.

Satisfied with his honors, Christie generously asked to be excused from the free-for-all championship, and this resulted in a long-drawn-out win for the Vanderbilt Darracq, which lost the first heat to the Stanley steamer and the second one to the Cape May Darracq. After winning a heat Rogers had trouble with the steamer's brake and was unable to start in the second mile. In the third scurry over the sands the steamer succumbed to the Vanderbilt Darracq, which took the fourth heat and the Atlantic City Cup. Rogers was put out of the running by the hood flying up and striking him in the face, though he retained his presence of mind, stopped the machine, and escaped with a bruised face and bloody nose.

Touring Cars Supplied Excellent Sport.

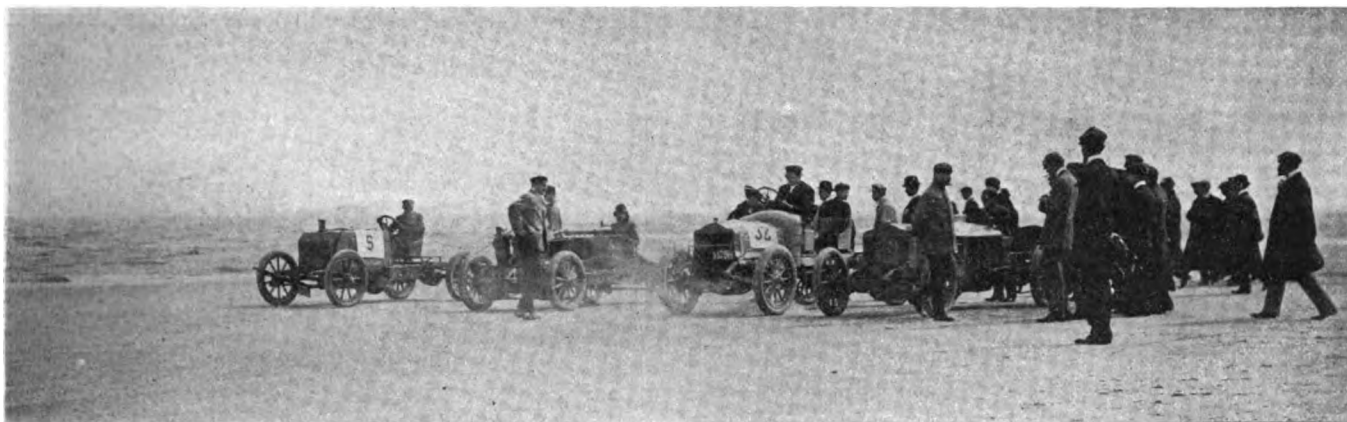
Though the high-speed travelers occupied more or less of the center of the stage and supplied the spectacular trimmings, the bulk of attention was given to the well-filled events for touring cars.

On the opening day that veteran of racing, Charles Soules, piloted a 35-horsepower Pope-Toledo first across the line in the \$4,000 class; W. H. Hilliard, winner of the Mount Washington climb, successfully drove a Napier in the four-cylinder class, and Mortimer Roberts, with a 50-horsepower Thomas, triumphed in the stripped struggle. The Stoddard-Dayton jumped into the limelight with first and second in two events—in the 30-horsepower class for American cars and again in the price handicap.

Of the steam contingent, H. Ernest Rogers was the only one to obtain any glory, and his Stanley did the mile in 0:42 3-5. Harry Maynes was put out of the running by a leaky valve, and Mrs. J. N. Cuneo hardly expected to get under the minute with her White stock car.



ONE HEAT OF THE MILE STANDING-START CHAMPIONSHIP RESULTED IN A FALSE START IN WHICH THE DARRACQ ARRIVED FIRST.



START OF THE FIRST HEAT OF THE MILE STANDING-START CHAMPIONSHIP IN WHICH A CHRISTIE WAS WINNER.

First Day, Wednesday, April 25.

MILE CHAMPIONSHIP GASOLINE—STANDING START.

1. Christie, 110 h.p.; owner and driver, Walter Christie..... 0:53
2. Napier, 80 h.p.; owner, Napier Motor Co. of America;
driver, W. H. Hilliard..... 1:00 2-5
3. Thomas, 60 h.p.; owner, Henry S. Houpt; driver, M.
Roberts 1:08 1-5

MILE TOURING CARS, GASOLINE, SELLING AT \$4,000 OR LESS.

1. Pope-Toledo, 35 h.p.; owner, G. S. Mann; driver, Charles
Soules 1:13 2-5
2. Thomas, 50 h.p.; owner, Harry S. Houpt; driver, M.
Roberts 1:15
3. Pope-Toledo, 35 h.p.; owner and driver, Stewart H.
Elliot 1:16

ONE MILE CHAMPIONSHIP FOR FOUR-CYLINDER CARS.

1. Napier, 80 h.p.; owner, Napier Motor Co. of America;
driver, W. H. Hilliard :46 2-5
2. Thomas, 50 h.p.; owner, Harry S. Houpt; driver, A. S.
Robinson :58 3-5

ONE MILE STRIPPED TOURING CARS, 50 H. P. OR UNDER.

1. Thomas, 50 h.p.; owner, Harry S. Houpt; driver, M. Rob-
erts 1:02
2. Chadwick, 40-45 h.p.; owner and driver, E. B. Jackson.. 1:06 4-5
3. Pope-Toledo, 35 h.p.; owner, H. E. Woodman; driver,
Charles Soules 1:08 2-5
4. S. & M. Simplex, 30 h.p.; owner, J. S. Bunting; driver, Al.
Poole 0:00

ONE MILE AMERICAN TOURING CARS, 30 H. P. OR LESS.

1905 Winner, Charles Bacharach.

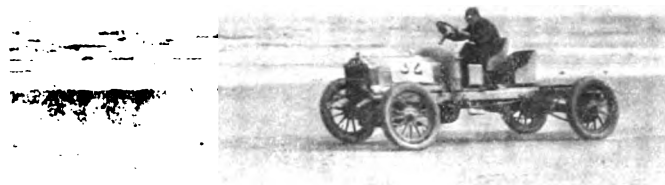
1. Stoddard-Dayton, 30 h.p.; owner and driver, P. F. Rockett 1:17 3-5
2. Stoddard-Dayton, 30 h.p.; owner and driver, F. S. Walton 1:18
3. Acme, 30 h.p.; owner and driver, P. A. Fogarty..... 1:18 3-5
4. Packard, 24 h.p.; owner and driver, C. B. Bacharach..... 0:00

ONE MILE PRICE HANDICAP FOR FOUR-CYLINDER TOURING CARS—REGULAR EQUIPMENT, TO CARRY FIVE.

1. Stoddard-Dayton, 50 h.p.; owner and driver, F. S. Wal-
ton, 17 sec..... 1:25 2-5
2. Stoddard-Dayton, 30 h.p.; owner, Zim Rock Motor Co.;
driver, P. F. Rockett; 17 sec..... 0:00
3. Acme, 30 h.p.; owner, P. A. Fogarty; driver, D. Landau;
12 sec..... 0:00

ONE MILE RECORD TRIALS, STEAM.

1. Stanley, 20 h.p.; owner and driver, H. E. Rogers..... :42 3-5
2. White, 18 h.p.; owner and driver, Mrs. J. N. Cuneo..... :00



H. S. HOUP'T'S 50-H.P. THOMAS WINNER STRIPPED TOURING CLASS



THE REO BIRD, WINNER OF THE MIDDLEWEIGHT CHAMPIONSHIP.



ON THE OPENING DAY OF THE MEET THE WEATHER WAS PERFECT AND THE GRANDSTAND HELD THOUSANDS OF PEOPLE.



POPE-TOLEDO WINNER; OWNER, G. S. MANN; DRIVER, SOULES.



J. E. BRISTOL AND PIERCE TOURING CAR CHAMPION.

The Doings of the Second Day.

On the second day the touring car championship made a race that counted as one of the best of the whole meet. Starter Wagner had his difficulties in getting the six qualifiers for the final off to a good start. J. E. Bristol was a happy Brooklynite whose Pierce fired the finishing gun. The others were close up, and the race was fought all the way. Harding, the Daimlerite, appeared to have made a mistake in selecting his course, and after the race filed a protest against the start, claiming that, being the pole car, none should have gotten away in front of him. Referee Morrell listened to the evidence in the evening and ruled that the work of the starter was perfectly fair. Archie Hughes, another Pierce driver, admitted that he had been negligent at the start and believed he would have won had he not been caught napping.

There was nothing to the middleweight championship except a romp for the 32-horsepower Reo Bird, Mrs. Cuneo with a 10-horsepower Maxwell being the runner-up.

The price handicap for two-cylinder cars showed H. J. Koehler a Buick winner, and a car of the same make finished behind him. It was the same thing over again in the runabout class for cars selling at \$1,000 or less.

Four Maxwells participated in the lightweight record trials, and Mrs. Cuneo excelled the others in 1:25 3-5. Then came Charles Fleming in 1:29 2-5, and Mrs. Rogers required 1:31 for her mile. C. W. Kelsey, trying a kerosene burner, was fourth in 1:36.

Of the half-dozen cars that started in the quarter-mile high-gear test, the only survivor was J. N. Wilkins, Jr., with a 20-horsepower Winton. He traveled the slowest on the high speed without stopping his car.

Second Day, Thursday, April 26.

ONE MILE HEAVYWEIGHT GASOLINE CHAMPIONSHIP.

1. Christie, 110 h.p.; owner and driver, Walter Christie....	:46 4-5
2. Darracq, 80 h.p.; owner, S. B. Stevens; driver, Guy Vaughan	:47 1-5
3. Thomas, 60 h.p.; owner, Harry S. Houpt; driver, M. Roberts	:00



MRS. J. N. CUNEO DRIVING A MAXWELL AS "NO. 23."



P. F. ROCKETT AND HIS STODDARD-DAYTON WINNER.



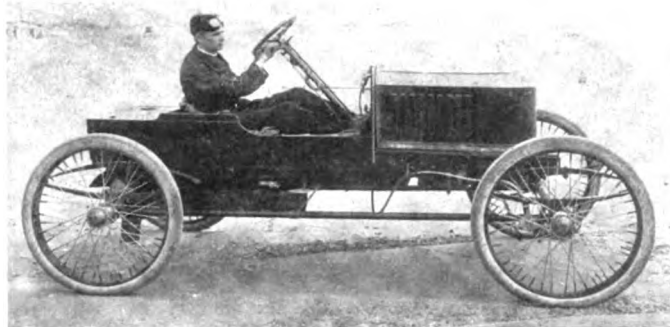
J. E. DEMAR AND DAIMLER THAT WON FOREIGN CLASS.



OFFICIAL STAND—WINTON WINNER OF HIGH-GEAR TEST.



F. S. WALTON, STODDARD-DAYTON WINNER OF HANDICAP.



H. E. ROGERS AND THE STANLEY STEAMER.

**ONE MILE TOURING CAR CHAMPIONSHIP, 50 H. P. OR UNDER
—REGULAR EQUIPMENT, TO CARRY FIVE PASSENGERS.**

- | | |
|--|----------|
| 1. Pierce, 40-45 h.p.; owner and driver, J. E. Bristol..... | 1:07 2-5 |
| 2. Thomas, 50 h.p.; owner, John Megraw; driver, W. C. Thomas..... | 1:08 2-5 |
| 3. Pierce, 40-45 h.p.; owner, C. B. Prettyman; driver, Archie Hughes..... | 0:00 |
| 4. English Daimler, 30-35 h.p.; owner, English Daimler Co.; driver, H. N. Harding..... | 0:00 |
| 5. Thomas, 50 h.p.; owner, Martin & Hart Co.; driver, E. R. Kelly..... | 0:00 |
| 6. Pope-Toledo, 35 h.p.; owner and driver, Stewart Elliot.. | 0:00 |

ONE MILE MIDDLEWEIGHT GASOLINE CHAMPIONSHIP.

- | | |
|--|----------|
| 1. Reo Bird, 32 h.p.; owner, Reo Motor Co.; driver R. L. Lockwood..... | 1:00 2-5 |
| 2. Maxwell, 10 h.p.; owner and driver, Mrs. J. N. Cuneo.... | 1:28 4-5 |

ONE MILE PRICE HANDICAP FOR TWO-CYLINDER TOURING CARS—REGULAR EQUIPMENT, CAR TO CARRY FIVE PASSENGERS. \$1,500 CAR ON SCRATCH.

- | | |
|---|----------|
| 1. Buick, 22 h.p.; owner and driver, H. J. Koehler; 2 sec.... | 2:06 1-5 |
| 2. Buick, 22 h.p.; owner, Pennsylvania Electric Vehicle Co.; driver, W. Haupt, 5 sec..... | 0:00 |
| 3. Cadillac, 10 h.p.; owner and driver, Archie Hughes, 11 sec..... | 0:00 |

ONE MILE GASOLINE RUNABOUTS, SELLING AT \$1,000 OR LESS, TO CARRY TWO PASSENGERS AND REGULAR EQUIPMENT.

- | | |
|--|----------|
| 1. Buick, 22 h.p.; owner and driver, H. J. Koehler..... | 1:50 3-5 |
| 2. Buick, 22 h.p.; owner, Pennsylvania Electric Vehicle Co.; driver, W. Haupt..... | 1:17 2-5 |
| 3. Maxwell, 10 h.p.; owner, Maxwell-Briscoe Co.; driver, Charles Fleming..... | 0:00 |
| 4. Maxwell, 10 h.p.; owner and driver, Mrs. J. N. Cuneo.... | 0:00 |

ONE MILE RECORD TRIALS GASOLINE CARS, 881 TO 1,432 POUNDS.

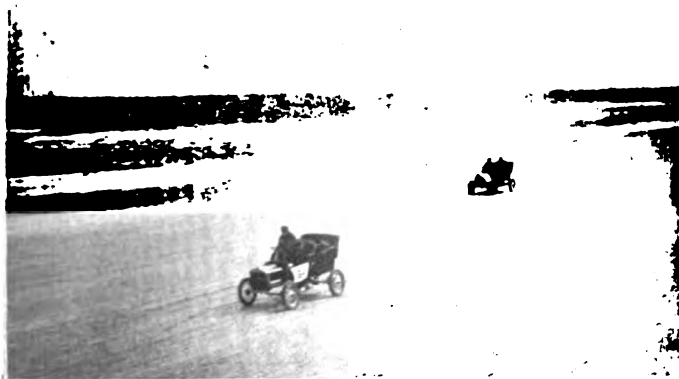
- | | |
|---|----------|
| 1. Maxwell, 10 h.p.; owner and driver, Mrs. J. N. Cuneo.... | 1:25 3-5 |
| 2. Maxwell, 10 h.p.; owner, Maxwell-Briscoe Co.; driver, Charles Fleming..... | 1:29 2-5 |
| 3. Maxwell, 10 h.p.; owner and driver, Mrs. E. R. Rogers.... | 1:31 |
| 4. Maxwell, 10 h.p.; owner, Maxwell-Briscoe Co.; driver, C. W. Kelsey..... | 1:36 |

ONE MILE MISCELLANEOUS RECORD TRIALS.

- | | |
|---|----------|
| Flat, 24 h.p.; owner, Hol-Tan Co.; driver, E. Cedrino..... | :55 1-5 |
| Thomas, 50 h.p.; owner, Harry S. Hout, driver, M. Roberts.. | :55 4-5 |
| Grout, 30 h.p. steamer; owner and driver, Harry Maynes.. | 1:19 2-5 |

QUARTER MILE HIGH GEAR TEST.

- | | |
|---|---------|
| Winton, 20 h.p.; owner and driver, J. N. Wilkins, Jr..... | No Time |
|---|---------|
- Winner covered distance slowest on the high gear.



H. J. KOEHLER AND-BUICK WINNER OF TWO EVENTS.



HARRY MAYNES AND THE GROUT STEAMER.



E. C. JOHNSON, "WHITE" WINNER OF CHAUFFEURS' HANDICAP.



MRS. J. N. CUNEO TAKES A LOOK AT THE MOTOR.



McMURTRY TO THOMPSON.



FIAT-ER TANGEMAN WAS PRESENT.



BUTLER AND OTHER SIBERIANS.



RIKER, ONE OF THE RELIABLES.

THOMPSON, MORRELL, COOK,
REEVES, WAGNER.

And On the Third Day.

On the closing day the distance annihilators did most of the racing. The Stoddard-Dayton added to its laurels by a win of the \$2,000 class, in which a Columbia ran a close second. The English Daimler had matters its own way in the foreign touring car class, President W. E. Edge's lesser powered Darracq being its only opponent. The chauffeurs' handicap fell to a White steamer driven by E. C. Johnson, and the handicap for the one-minute class fell to a 50-horsepower Thomas, with a car of the same make as its solitary rival in a decidedly close finish.

Third Day, Friday, April 27-

ONE MILE FREE-FOR-ALL CHAMPIONSHIP, BEST TWO AND THREE HEATS, FOR THE ATLANTIC CITY CUP, TO BE WON TWICE FOR PERMANENT OWNERSHIP.

Darracq, 80 h.p.; owner, S. B. Stevens; driver, Guy Vaughan	2	2	1	1
Darracq, 80 h.p.; owner, C. A. Schroeder; driver, Wm. Wallace, Jr.	3	1	3	2
Stanley, 20 h.p.; owner and driver, H. E. Rogers	1	0	2	dr.
Thomas, 60 h.p.; owner, H. S. Haupt; driver, M. Roberts	4	4	4	r.o.
Thomas, 50 h.p.; owner, H. S. Haupt; driver, A. Robinson	6	3	5	r.o.
Thomas, 50 h.p.; owner, Martin & Hart Co.; driver, E. R. Kelly	5	5	dr.	
Time, :49 1-5, :53 2-5, :47, :47 3-5.				

MILE RECORD TRIALS GASOLINE CARS, 1,432 TO 2,204 LBS.

1. Christie, 110 h.p.; owner and driver, Walter Christie	:35 1-5
2. Darracq, 80 h.p.; owner, S. B. Stevens; driver, Guy Vaughan	:39
3. Darracq, 80 h.p.; owner, C. A. Schroeder; driver, Wm. Wallace, Jr.	:39 3-5
4. Thomas, 60 h.p.; owner, H. S. Haupt; driver, M. Roberts	:51 3-5
5. English Daimler, 30-35 h.p.; owner, English Daimler Co.; driver, H. N. Harding	:55 4-5
6. Thomas, 50 h.p.; owner, H. S. Haupt; driver, A. Robinson	:57

MILE GASOLINE TOURING CARS SELLING AT \$3,000 OR LESS.

1. Stoddard-Dayton, 30 h.p.; owner, Zim Rock Motor Co.; driver, P. F. Rockett	1:22 1-5
2. Columbia, 24 h.p.; owner, Electric Vehicle Co.; driver, H. P. Bellevue	1:22 3-5
3. Stoddard-Dayton, 30 h.p.; owner and driver, F. S. Walton	0:00

ONE MILE FOREIGN TOURING CARS.

1. English Daimler, 30-35 h.p.; owner, English Daimler Co.; driver, H. N. Harding	1:14 4-5
2. Darracq, 20-30 h.p.; owner, W. E. Edge; driver, E. Jacquelin	1:36 4-5

ONE MILE CHAUFFEURS' HANDICAP.

1. White, 18 h.p.; owner, W. W. Hepburn; driver, E. C. Johnson; 40 sec.	1:25
2. Thomas, 60 h.p.; owner, H. S. Haupt; driver, M. Roberts; 15 sec.	1:30 2-5
3. Pope-Toledo, 35 h.p.; owner, S. H. Elliot; driver, Albert Crane; 25 sec.	0:00

ONE MILE ONE MINUTE CLASS HANDICAP.

1. Thomas, 50 h.p.; owner, H. S. Haupt; driver, A. Robinson; 5 sec.	1:13 1-5
2. Thomas, 60 h.p.; owner, H. S. Haupt; driver, M. Roberts; scratch	1:13 3-5

The Atlantic City A. C. May Feel Proud.

All in all, the Atlantic City meet must be considered the most successful ever held in the North, and the Atlantic City Automobile Club has good reason to feel satisfied with its work. Alfred Reeves, the indefatigable, was the racing secretary, and from the officials and the Race Committee of the club he received all kinds of support. One could find mighty few flaws, and these were not worth talking about. One thing was noticeable on the concluding day, when Referee Morrell located at the starting point instead of being at the finishing line. The contestants moved with greater alacrity and the hard-working Wagner found his labors less exacting. Chairman J. D. Thompson of the A. A. A. Racing Board graced the occasion as honorary referee, and other notables of the sport and trade were present from New York, Philadelphia, and other cities. All the "who's who" contingent in automobiling appeared to be among those present. Of course, the timers were such good ones as McMurry, Butler and Kerrison.



MRS. ROGERS AN ENTHUSIAST.



CEDRINO OF THE FIAT, JR.



THE ONLY TIRE TENT.



ENGINE OF THE "BLUE STREAK."



THEN THE TIDE CAME IN.

EUROPEAN CIRCUIT WILL BE HARD TASK.

By W. F. BRADLEY.

PARIS, April 15.—Notwithstanding the complete regulations and the various official notices published in the French press, there is a profound ignorance as to what the endurance contest known as the European Circuit really is. The other day the 24-horsepower De Dion-Bouton, in which M. Journu, Frantz Reichel and M. Branger, the Paris photographer of THE AUTOMOBILE, had completely explored the circuit from start to finish, drew up in front of the Automobile Club of France after an absence of over three weeks. The trio are the only persons who have a practical knowledge of the circuit, and their experience is therefore particularly interesting.

"Our 3,150 miles journey," said M. Branger, "lay through France, Italy, Hungary, Austria, Bohemia, from one end of Germany to the other, and Alsace-Lorraine."

The run through France was quite a commonplace event. There was snow at Lyons, although it was the end of March, and in the mountain districts all traffic was stopped; but it was not until Grenoble was reached that the roads became bad. From this town to Milan, a distance of 243 miles, is the first foreign stage of the circuit, and it had to be given up as impracticable, all the roads being hidden under several feet of snow. The De Dion-Bouton was shipped on the train and passed through instead of over the Alps, by way of Mount Cenis taking the road again at Bardonecchia.



CROSSING THE FAMOUS BRIDGE OF LODI.

Italy, the land of blue skies and vineclad hills, offered a weary spectacle under the gray March skies, and the roads were such as would strike terror into the hearts of the most resolute automobilist. From Suze to Turin one would describe it as bad, but from Turin to Milan no other word than abominable could be applied to it. Constructed of soft, greasy earth, over which stones have been loosely thrown, there are two deep furrows where the wheels of carts have passed and a well beaten muddy track in the center where horses have wearily plodded. When the wheels of the automobile are wedged in the deep furrows it is impossible to get them out again without breaking the steering gear, and when the driver endeavors to cut out a new track for himself there is so much thumping and rolling, and the car runs so dangerously near to the sentinel-like stone ports placed along the edge of the road that he is much perplexed as to which is the lesser evil.

Being winter the road conditions were slightly better than they will be in summer, for, however injurious the mud might be to the car, it is always preferable from the passenger's point of view to the dusty surface which the dry season will bring. As to the average speed of 45 kilometers an hour, which is imposed for certain categories, it will be utterly impossible, said M. Branger, for the competitors to perform it. Even the 24-horse-

power De Dion-Bouton, which ran remarkably well throughout the whole journey and required no tinkering, was not able to cover the stages in the regulation time. There were certain stretches of the road on which a speed of 40 to 45 miles an hour



GYPSY WAGONS ON THE ROAD BETWEEN ZNAIM AND IGLAU.

could be attained, but the road conditions never allowed this to be carried on for long.

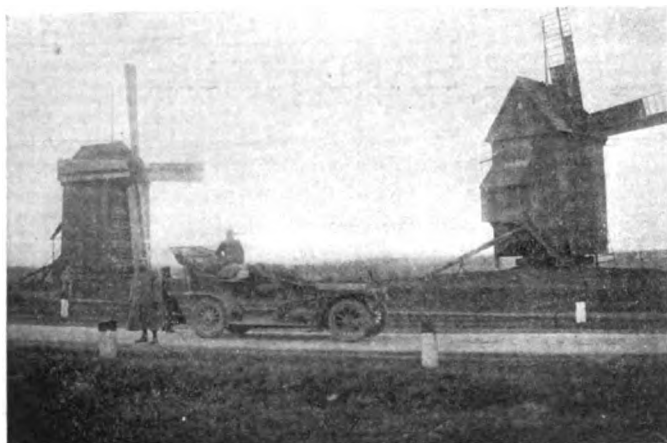
In Austria the road conditions were even worse than in Italy, and, to add to the difficulties, every time a horse was met the motor had to be stopped and the scared animal led by with great care. Notwithstanding all their precautions, the travelers had to plead guilty to causing the smash-up of many a cart, owing to horses bolting, and on one occasion they were the indirect cause of the death of a cow, a horse having shied and the shafts of the cart piercing the body of the poor beast. Half-wild dogs, which had never before seen an automobile, on more than one occasion had to pay the supreme penalty for their inquisitiveness.

In Italy, Austria, and parts of Germany the peasants displayed no more intelligence than did their four-footed companions, and the automobilists had to learn the art of dodging stones. Either the country folk were not well trained as marksmen, or the travelers were very successful in dodging, for neither the stones nor



A HALT BETWEEN BRESLAU AND LIEGNITZ IN SILESIA.

the gun-shots did any serious injury. Even the hotelkeepers only displayed a more refined form of savagery, the most perfect form of which was shown by an Austrian host, who presented a bill for \$14, dinner for four people. The chauffeur was included in



ROAD BETWEEN LIEDNITZ AND FRANKFORT ON ODER.

that amount for \$2.80. What an appetite that chauffeur must have had!

Outside France the obtaining of a supply of gasoline often gave anxious thought to the pioneers. In Italy and Austria the average price was 20 cents per liter, oil being proportionably dear. Three moderate-sized Austrian towns could not supply a drop of fuel. During the contest no such trouble will be met, for the organizers will place supply stations all around the circuit, where gasoline will be sold at a uniform rate of 8 cents a liter. To avoid the trouble of carrying a large amount of cash, checks can be obtained at the start at the price of 8 cents, each one being good for a liter of gasoline at any store on the circuit. Any left over at the end of the tour will be, of course, refunded at full value.

No difficulty was experienced in obtaining spare tires en route. It was necessary, however, to always carry a liberal stock on the car, for the abominable track serving as roads eat up tires with amazing rapidity. The De Dion-Bouton's consumption for the maiden voyage was eight outer covers and eight air chambers. Thus, for outer covers at \$44 and inner tubes at \$14 the total tire bill amounted to \$464. Some little patching of the road will, of course, be done before the tour commences, but obviously it can be nothing more than patching, and competitors may safely calculate on the sum quoted for tire expenses. Add to this \$400 for entrance, and together with driver's expenses the total will certainly run up to \$1,000 per car.

The regulations stipulate that each competitor must declare before the event the number of tires he intends to carry, in order to form a basis for classification in the tire competition. Profiting by the experience of the first car to cover the circuit thoughtful competitors will not fix this number too low for the journey. Although nothing has yet been officially announced, it is ex-

ceedingly probable that changes will be made in the existing regulations, experience having shown that it is impossible to cover many of the stages at the average speed at present required. If a lower speed is admitted, the driver would have to remain at the wheel seventeen hours a day on certain sections—a human impossibility. The only solution, therefore, will be to cut some of the more difficult stages in two and extend the event over several days more.

No possible doubt will remain at the end of the trial as to the reliability and solid construction of the cars which accomplish the test. Nothing but the very best can hope to withstand the terrible strain of more than 3,000 miles over Europe's best as well as worst roads. To come out on top the driver, too, must be a man of great skill in the handling of an automobile.

Forty-nine Entries Received by First Closing Date.

At 6 o'clock, April 20, entries at ordinary fees closed for the great 3,000 miles endurance contest. The nations represented include France, America, England, Germany, Belgium and Italy, with a total of 49 competitors.

The only American car is a Pierce Great Arrow, entered by Percy P. Pierce, of Buffalo, which engagement was only received twenty-four hours before the closing of the lists.

Not many Italian entries had been received at the time of closing, but a request had been forwarded that the date should be postponed one month in order to allow several Italian firms anxious to take part in the competition to carry out the necessary formalities of engagement. It is pointed out that there is already a long interval between the closing of the lists on April 20, and the commencement of the tour on July 26. The committee does not feel justified in making such an important change on its own responsibility, but entered into telegraphic communication with the foreign clubs interested in the event and will give an early decision.

A message received from the secretary of the committee just as the American mail closes states that there is every probability of the date of entries at ordinary fees being advanced to May 30. It is thus safe to predict a bumper entry for the circuit.

The following is a list of the competitors in the order in which engagements were received: Two Darracq, France; 2 Mercedes, Germany; 1 Wolseley, England; 1 Regina Dixie, France; 1 Dixie, France; 4 De Dion Bouton, France; 1 Borderel, France; 4 Benz, France; 1 Pilain, France; 1 Scribe, France; 3 British Daimler, England; 2 Chenard Walcker, France; 1 Gobron Brillié, France; 1 Corneille and Sainte-Beuve, France; 2 Beerton-Humber, England; 1 Fiat, Italy; 3 Peugeot, France; 1 Pierce Great Arrow, America; 1 Pilain, France; 1 De Dion Bouton, France; 1 Krieger, France; 1 Wolseley, England; 1 Martin and Lethimonnier, France; 1 Benz, Germany; 1 Metallurgique, Belgium; 1 Alcyon, France; 2 Delahaye, France; 1 Itala, Italy; 1 Saventhem, Belgium; 1 Benz, Germany; 4 De Dion Bouton, France.

AUTOMOBILE ACCIDENTS IN LONDON.

A total of 1,726 accidents due to automobiles, motor omnibuses, and motorcycles were reported by the London police for the first three months of the present year, according to Herbert Gladstone, who gave the statistics in reply to a question put to him recently in the House of Commons. For the separate months the figures are: January, motor omnibuses, 211; autos and motorcycles, 301; February, omnibuses, 235; autos and motorcycles, 263; March, omnibuses, 331; autos and motorcycles, 385. Thus, in the three months omnibuses caused 949 accidents, and other automobiles and motorcycles, 777. The maximum legal speed in the London area is twenty miles an hour for pleasure vehicles and twelve miles for omnibuses.

Considering the great congestion of traffic in London and the fact that many minor accidents are included in the reports, whether directly caused by the power vehicles or not, the figures given are not considered excessive.



ON THE ROAD NEAR FRIESACH IN AUSTRIA.

THE CARBURETER AND ITS FUNCTIONS.

MOST automobilists are aware, to their sorrow, of the fact that the carbureter is not as simple a device as it might seem at first glance, that its importance to the working of the engine is out of all proportion to its size, and that to master even a single carbureter to the extent of being able to adjust it to give the best results under given conditions is a matter requiring more than a cursory study. But the real magnitude

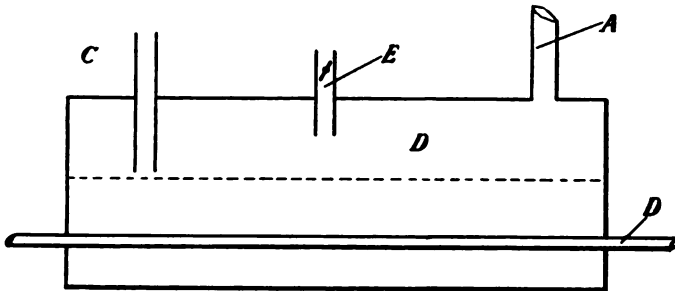


FIG. 1.—DIAGRAMMATIC SKETCH OF SURFACE CARBURETER.

of the subject is not generally appreciated, nor can it be without some knowledge of the various influences that must be reckoned with in making a carbureter as nearly perfect as possible.

Briefly stated, the function of the carbureter is to change a liquid hydrocarbon, such as gasoline, into a gaseous state and mix the gas thoroughly with air in certain proportions. This sounds quite simple, and the means taken to form the mixture were, in the early days of the explosion motor, correspondingly simple.

Fig. 1 is a diagram of the surface carbureter, as it is called, and was at one time the approved form. The surface carbureter was usually the gasoline tank itself, and from the top of the tank a pipe *A* established communication with the cylinder of the engine, through the inlet valve. As gas was drawn from the space *B* in the top of the tank it was replaced by air entering through a pipe *C*, whose inner end was brought close to the surface of the gasoline; thus the current of air caused rapid evaporation or "gasifying" of the liquid, and this was not infrequently augmented by heating the gasoline by running through it a pipe *D*, through which a portion of the hot exhaust gases passed, or by jacketing the air pipe *C* and passing part of the exhaust gases through the jacket, thus warming the air. As the gas formed in this way was much too rich—that is, contained too large a proportion of gasoline to ignite and burn properly in the engine cylinder—an extra air inlet was necessarily fitted, or else the regular air inlet was made adjustable. The usual practice was to use the extra air inlet, *E*, placed either in the tank, as shown, or in the pipe leading to the inlet valve. The adjustable air valve was controlled by hand, and had to be changed every time the speed of the engine varied to any considerable degree. And as the gasoline level in the tank became lower, the gasoline became heavier and less volatile because the lighter portions naturally evaporated first. Ultimately there would be left in the bottom of the tank a thick, sticky mass that was, of course, rather worse than a nuisance. As the gasoline level sank, the extra air supply had to be continually changed to suit the conditions—that is, the heavier and less volatile the gasoline became, the more air had to be taken in through the regular opening, so as to create a sufficiently strong current to evaporate the gasoline.

The wick carbureter followed the surface carbureter and was practically the same thing except that the gasoline was

soaked up by a wick and the air drawn through or over the wick, from which it took up or evaporated the gasoline. While in some respects an improvement on the original surface carbureter, the wick carbureter possessed practically all the failings of the other, most of them, however, being present in a lesser degree.

The surface carbureter was found to be too primitive for even the early motors, and though it was much improved by the addition of constant level chambers and other devices, it was practically abandoned in favor of the jet or spray carbureter, the type now in use. The principle of operation of this form of carbureter is shown in Fig. 2. Perhaps the easiest way to understand the operation of this carbureter is to follow the course of the gasoline as it goes through. Through the small pipe *A* gasoline flows from the main supply tank to the float chamber *B*, in which is a float *C*, made of hollow metal or of cork. Attached to the float is a needle valve *D*, the valve seat being in the opening through which the supply of gasoline enters. It will be seen that as the gasoline enters the float chamber it must raise the float, and when the float has risen sufficiently high, the valve seats itself and stops the inflow of gasoline. The height to which the gasoline rises before being shut off is governed by the length of the valve stem, which is usually adjustable. If any gasoline is taken from the float chamber, the float at once falls and reopens the valve until the original level is restored.

From the lower part of the float chamber a passage *E* leads to the spray nozzle *F*. The valve and float in the float chamber are so adjusted that the gasoline level is maintained a little below the opening in the spray nozzle *F*. Now suppose that the gasoline supply is turned on and flows through pipe *A* into the float chamber until the normal level is reached and the valve shuts it off; some gasoline will have run through the passage *E* and, in accordance with natural laws, will reach the same level in the spray nozzle *F*—just

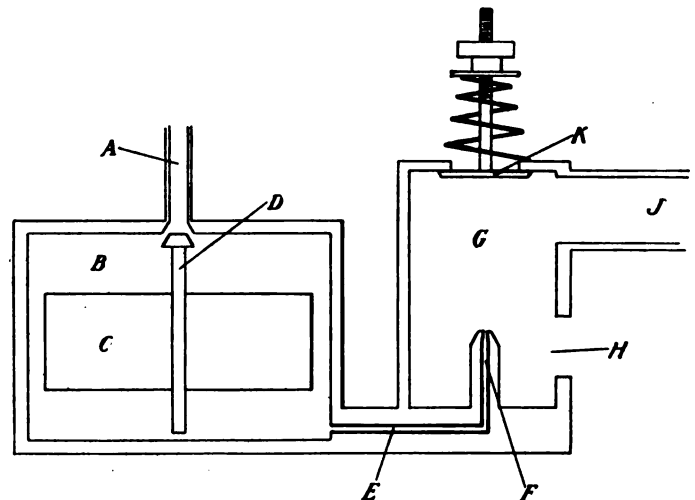


FIG. 2.—DIAGRAM OF FLOAT FEED CARBURETER.

below the opening. The motor is now started, and as the piston commences the suction stroke, a partial vacuum is created in the cylinder, the pipe *J* leading from the carbureter to the cylinder, and in the mixing chamber *G*. In this way air rushes in through the main air inlet *H*, and at the same time the gasoline automatically commences to flow from the nozzle *F* for the following reasons: When the carbureter is

at rest the air pressure on the surface of the gasoline at the spray nozzle *F* is exactly the same as the pressure on the surface of the gasoline in the float chamber *B*, and so the level of the liquid is the same in both. When, however, a partial vacuum is created in the mixing chamber *G*—in other words, when part of the atmospheric pressure is removed—the pressure in the float chamber, being undiminished, forces the gasoline to flow out through the nozzle. The gasoline meets and mechanically mixes with the air entering through the air inlet, the shape of the nozzle being such as to form a fine spray. The "mixture" passes to the cylinder of the engine through the inlet pipe *J*.

The area of the air opening *H* is so proportioned with relation to the area of the opening in the spray nozzle that when the engine is running slowly the proportions of gasoline and air taken in will be correct—that is, the mixture produced will ignite promptly and burn completely, without smoking or depositing soot, in the cylinder. If, however, the speed of the engine is increased considerably the amount of gas required is, of course, increased correspondingly and the suction becomes stronger. More air and more gasoline will be drawn into the mixing chamber; but the gasoline supply will increase more rapidly than the air supply, and if no preventive means were employed, the mixture would become too rich in gasoline vapor to burn properly, and a smoky exhaust and a sooted cylinder would result. It is clear that either the amount of air admitted must be increased or the amount of gasoline decreased; and it has been found that the former method is the easiest to compass. An auxiliary air valve *K*, opening inward, is normally held on its seat by a spring of carefully adjusted strength. When the suction of the engine becomes so strong that the gasoline supply increases unduly, the valve *K* is opened by the suction, thus admitting more air which becomes thoroughly mixed with the gas already formed. The stronger the suction becomes the more extra air is admitted; and if the various openings are correctly proportioned—a very delicate matter—the engine will always get gas of approximately correct proportions of gasoline and air.

The pressure exerted by the spring of the valve *K* can be regulated by means of a nut on the valve stem, and this is an important means of adjustment. There is also, as a rule, a valve of some sort for varying the area of the passage *E*, and the main air inlet *H* is sometimes variable. In some cases the spray nozzle *F* is so made that tips with different sized openings can be inserted. A throttle valve, sometimes placed in the air supply pipe, but more commonly in the top or side of the mixing chamber, serves to regulate the speed of the motor by throttling the amount of gas it is allowed to take from the carbureter.

While these are the principles involved in nearly all modern carbureters, the methods of applying the principles and the combinations made are so varied and sometimes so complex that the novice may easily be puzzled by a drawing of an elaborate carbureter. One of the faults of the carbureter shown in Fig. 2 is that if it is inclined so that the float chamber is higher than the mixing chamber, the gasoline will rise in the nozzle and overflow, making the mixture too rich in gasoline; while, if the inclination is in the opposite direction, so that the nozzle is higher than the float chamber, the gasoline will fall so low in the nozzle that the engine will be "starved" by the poverty of the mixture. The greater the distance between the two chambers, the more serious the effects of inclination. By so placing the carbureter that its length is across the car, the inclination when ascending a steep grade would not alter the relative heights of the nozzle and float chamber, but the sidewise tilting of the car, when running with the wheels on one side in a ditch, for instance, would have the same effect.

This difficulty is practically eliminated by placing the nozzle in the center of the float chamber, making the float

of annular shape. Such an arrangement is shown diagrammatically in Fig. 3. In this *A* is the float chamber, and through the center of it passes the mixing chamber *B*, the open lower end of which affords an opening which constitutes the main air inlet, while the supply pipe to the engine leads off from the top. The float, *C*, is a hollow metal ring, or else a cork ring, and is usually hinged at one side as at *D*, an arm *E* projecting and acting as a lever to open and close the gasoline valve *F*. The spray nozzle *G* is placed in the central mixing chamber and the auxiliary air valve at *H*. The principle of operation is precisely similar to that of the carbureter shown in Fig. 2, but the apparatus is unaffected by tipping in any direction.

Even a brief description of the numerous variations in design of carbureters involving the principles referred to would make a good-sized book. The auxiliary air valve is sometimes combined with the throttle; sometimes with the main air inlet; and is put in every imaginable place where a valve could be inserted. Sometimes the air regulation is effected by hand, and sometimes automatically. Sometimes there are two separate mixing chambers, each with its spray nozzle, one chamber being used at low speeds and both together for high speeds. The gasoline may enter at the top, the

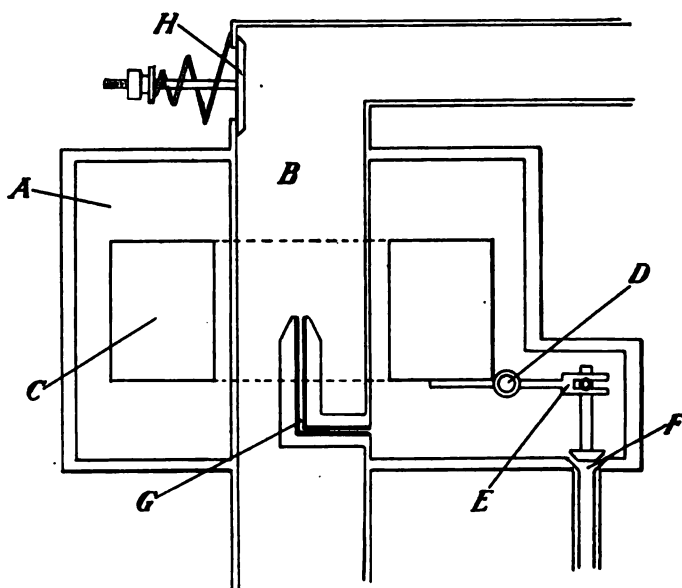


FIG. 3.—DIAGRAM OF CENTER JET CARBURETER.

bottom or the side of the float chamber. Sometimes the gasoline valve is actuated directly by the float, as in the diagrams, and sometimes it is actuated through a set of pivoted arms or levers. Sometimes, there is a rotating fan to thoroughly mix the air and gasoline. Sometimes the carbureter is heated by means of a water-jacket filled with hot water from the cylinder cooling system; and sometimes it has a jacket filled with hot gases from the exhaust. And so on, almost indefinitely.

Then there are carbureters of another class, usually classed as "mixing valves." In these there is no float chamber, the flow of gasoline being regulated by a valve opening or closing more or less according to the velocity of the air passing through; and many other devices are used to avoid the use of the float chamber and its accessories. Like the float feed carbureters, their name is legion and their variety astonishing.

Finally, it may be interesting to know that the price of a carbureter varies more, perhaps, than that of any other part of the car. A carbureter of the cheapest class can be bought for the price of a good dinner; while at the other extreme is found the carbureter that costs almost as much as a set of gas lamps.

MISSOURI MAY CONSTRUCT STATE ROADS.

JEFFERSON CITY, Mo., April 30.—A plan formulated years ago for two great trans-Missouri roads is being revived and is attracting widespread interest throughout the State. The idea must be credited to the late George M. Lane, of St. Louis county, who brought it into considerable prominence when he was advocating its adoption. He introduced in the Legislature a bill for this highway improvement, but it was sidetracked in favor of a measure permitting counties to increase the levy for improving roads. Lane's idea was to build one road from Kansas City to St. Louis, and another from Iowa to the Arkansas line, dividing the State into four sections, from which tributary roads could be built, at the discretion of the various counties. The system was estimated to cost \$1,300,000.

Since the Supreme Court declared invalid the constitutional

could be taken from this quarry to pave a considerable portion of the road close to the prison. The paving expense will be the heaviest part of the expense. The grading can be done at comparatively small cost.

The railroads are sufficiently interested in the project to offer to ship the material at cost, for bad roads in the State are losing considerable traffic that could be handled to advantage were the roads better.

ROADS ARE ALSO FOR AUTOMOBILISTS.

NEW LONDON, CONN., April 30.—Automobiling in this section is looking up, for in the last month a movement, strongly backed by automobile owners, has been set on foot, having for its purpose the preservation of the steel drawbridge over the Connecti-



LONG ISLAND, THE SCENE OF THE VANDERBILT CUP RACE, POSSESSES MANY MILES OF ROADS LIKE THIS ONE.

amendment authorizing counties to make the additional levy for road purposes, the plan is being again agitated, with the prospect that some action may be taken when the Legislature reassembles. The Lane idea was to utilize convict labor. The State of Missouri, however, leases its convicts to contractors for long-time periods, and 1,500 of the convicts best available for road work are under leases which have from three to five years more to run. For the present, or until these contracts expire, there would be not more than 300 men available for this sort of work. The next Legislature will undoubtedly be asked to make some provision whereby some of this labor can be released for highway work.

Missouri, for the most part, is underlaid with limestone of a variety that makes good macadam. In fact, there is a tract close to the penitentiary which is owned by the State and which is practically a big stone quarry. Enough material

cut river when the structure is abandoned by the railroad for the larger bridge now building. It is proposed to have the state maintain the old bridge for vehicular traffic and pedestrians—a very good purpose, for the old ferry at this point is inadequate and barely capable of accommodating the large touring cars. The matter of preserving the bridge has been taken up by the New London Board of Trade, and Senators Brandegee and Bulkeley, of Connecticut, have already consulted the War Department as to the feasibility of allowing the old bridge to remain, and if the department decides that the structure will not impede navigation, it is the intention to secure legislation which will amend the act providing for the new bridge which makes it incumbent upon the railroad to remove the old bridge.

Altogether there is a healthy attitude toward the automobile apparent in this section of Connecticut, where, a few years ago, much hostility was generated by narrow-minded legislators who

sought to make the cars proceed through cities and towns from east to west, or north to south, or reverse, along stipulated highways. These legislators have since been retired, and the cities and towns have found it profitable to invite the automobilist with open arms.

The large number of wealthy New York men having summer residences along the Sound shore hereabouts, who have used automobiles extensively and with apparent consideration of other vehicles on the roads, have done a great deal toward obliterating the former hostile attitude of horse owners. The city of New London has catered to the use of the power vehicles by setting aside one fine stretch of macadam road, covering the greater portion of the Pequot summer colony, and keeping it in the best repair. Speed contests are allowed, not advertised as such, of course; but when the automobilists decide to have a little showing of speed the authorities accommodatingly police the course and warn citizens of the danger of getting in the way. The result of this liberality is appreciable in the large number of cars owned in the city and surrounding towns.

STATE ROADS PLAN SAFE IN R. I.

PROVIDENCE, R. I., April 30.—The Legislature appropriated \$25,000 additional to the sum of \$600,000 for the completion of the state plan of good roads. The original plan was changed by the Board of Public Highways, which committee was brought up short by a country member of the Legislature, who pointed out that the bill was such that the original plans must be carried out. The extra \$25,000 was necessary to build good roads needed to complete trunk lines. When these are completed Rhode Island will have roads second to none in the country.

FEW AUTOMOBILES IN PERU.

"Automobiles are comparatively few as yet in Peru, owing to the scarcity of good roads," writes Consul-General Gottschalk from Callao. Intercommunication between coast cities is very slight, the various towns being separated by stretches of loose sand, which means heavy driving for all vehicles not provided with specially adapted wheels; the roads to the interior over the Andes have been much neglected since the advent of rail transportation a half century ago, and in the cities themselves the streets are usually paved with small flinty cobblestones.

The first automobiles were imported from America in 1905 by the Lima firm of Elguera Hermanos, the makes being Locomobile, Reo, and Olds. Close upon this followed an order for four more, one of which was sold to the municipality of Lima. Some French machines were then imported by private individuals. Then followed the introduction of three American Winton cars by C. Magella, of Lima, and a Columbia electric car by Godoy, manager of the Lima-Callao Electric Tramway. Not long after, the manager of the Eten Dock and Railway at Puerto Eten, L. Marquina, ordered another from the United States. The five heavy freight automobiles, for service between Lima and the port, were introduced from Germany by the firm of Muelle & Dammort.

The Ministry of Public Works at Lima is soon to have one for official touring, and Dr. Pardo's inspection of the recent military maneuvers at Infantas from an American-made touring car will lead, I am told, to the Government house being provided with one of our American machines. In the city of Lima particularly, which is gradually being repaved with Belgian block, there should in a few years be a decided increase in the number of cars in use. There is also talk of certain prominent merchants ordering a delivery car or two as an experiment. This diversified use of the motor car at a time so very near its introduction to the Peruvian public promises well for the future of that line of trade here.

Freights on cars imported from the United States are of course high, still they can compete with the rates from Europe. The cars themselves and their legitimate accessories are free of customs duties.

AUTO WOMEN SHOPPERS.

CLEVELAND, O., April 23.—Cleveland has long been famous for having a larger percentage of women drivers than almost any city in the country. The first women drivers were wives of prominent factory officials and managers of garages who had every opportunity for thoroughly learning the machines, and soon other women followed their example, until last year it was no uncommon thing to see a big touring car filled with women only, skimming along the boulevards or threading the congested business districts on shopping tours. Thousands of other women have viewed these sights with envious eyes. They opine that they are just as smart as the other women, and if Mrs. So-and-So can handle a big car and take her friends out riding, there is no reason why they can't do it. The result is that the woman automobile shopper is out in force. She looks over the automobile advertisements in the daily papers and makes the rounds of the salesrooms in about the same frame of mind that she would if she were shopping for a new bonnet. Usually Madame has a friend with her. They admire the upholstery and the finish of the body, but as a rule they don't know any more about what makes the car go than a baby does about astronomy.

The writer happened in a store the other day and wasted half an hour waiting for an opportunity to talk to a manager, who had corralled—or been corralled by—two women shoppers. The manager started at the beginning and carefully pointed out the engine, the carbureter, the ignition system, and control mechanism. He showed them a section of a valve and explained at great length that the valve parts were "umsteen thousand point carbon" and that the valves were placed in the top of the head in the most accessible position. One of the women then asked to be shown the carbon and the other inquired what the valve was for anyway.

Without waiting for the salesman to get his breath, the first shopper remarked that the machines all seemed to be different and that she guessed she could learn how to run it after she had made her purchase. The second last said, "yes," she had bought a new sewing machine a short time before and it seemed terribly complicated at first, but now she could run it just lovely, and it would probably be very easy to learn to run the auto. "But of course," she added, "we wouldn't think of buying until we have seen how the car runs."

The salesman took the cue: Would the ladies have time to go for a ride?

They seemed to hesitate—were almost startled at the idea, but it didn't take them two seconds to make up their minds; they would, with pleasure.

The writer had seen these same women out riding with another dealer earlier in the day and with still another one the day before. A shrewd dealer will soon learn to recognize this class of shopper just as the wise floor walker in a department store gets wise to the class of women who have party gowns or expensive hats sent home on approval the evening before a party and then find that they don't like the article the next day. But until the garage managers do catch on to this comparatively new dodge, a lot of apparently wealthy women—whose husbands can barely pay the rent, let alone buy an automobile—will enjoy the pleasures of many park rides and the dealers will have nothing to show for their time and gasoline.

Some English automobilists are agitating a movement for the adoption of a code of signals to be used to indicate the intentions of drivers with regard to direction. Horn signals are suggested to inform all on the road, whether automobiling or not, exactly what the intentions of the signaling party are. The following signals, it is thought, would be easily understood: For a car going straight ahead, one quick blast, repeated with an interval between, as often as necessary; for turns to the right, two quick blasts in rapid succession, and for turns to the left, three short blasts; for backing, one long-drawn-out blast.

LANCIA'S LUCK RETURNS IN MONACO DASHES.

By W. F. BRADLEY.

MONTE CARLO, April 17.—The final day at Monaco resulted in a victory for the Italians, *Fiat XIII.* carrying off the Prince of Monaco Cup, value \$2,000, and \$1,000 in cash, in face of French and British opposition. The event was for the mile and kilometer championship, the time for the mile being taken with a standing start and the kilometer with a flying start, open to all craft having won in their class races.

There were three rounds, the first one being for boats up to 26 feet, competed for between Baron de Cater's *Seasick*, driven by an Itala motor, and *La Rapière*, the French champion. *Seasick* got ahead from the start and beat the *Rapière* easily, her time being 3:36 for the total distance, 2:25 2-5 being for the sea mile and 1:10 3-5 for the kilometer. This created a world's record for the kilometer over a sea course, the speed being equivalent to 31.3 miles an hour. The still water record for the same distance belongs to the 1905 *Dubonnet*, Delahaye motor, in 1:06 1-5 (33.8 miles an hour).

The second round, for boats up to 39 feet, brought together *Fiat XIII.*, *Calypso*, a 40-horsepower Mors, and the *Yarrow-Napier*. *Fiat XIII.* handily won in 3:04 3 1-5, *Calypso* being second, and *Yarrow-Napier* third.

The round for boats up to 59 feet brought together *Delahaye*, *Dubonnet*, *Pampa*, *Mercedes W. N.* and *Mercedes D. L.*, and resulted in a win for the *Delahaye* in 3:58.

There were thus three boats left to run in the final, and a keenly disputed race was witnessed. *Fiat XIII.*, known here as Lancia's boat, owing to the Italian champion being frequently on board during the races, came in first, *Seasick* was second, and *Delahaye* third. The official result was:

1. <i>Fiat XIII.</i> : Motor, Fiat; hull, Taroni.....	2:25	1:11 4-5
Average on kilometer 27.5 miles an hour. Total 3:51 2-5		
2. <i>Seasick</i> : Motor Itala; hull, Tellier & Gérard..	2:26	1:15 4-5
Average on kilometer 29.7 miles an hour. Total 3:41 4-5		
3. <i>Delahaye</i> : Motor, Delahaye; hull, Brosse & Touché	2:35	1:16 2-5
Average on kilometer 27.5 miles an hour. Total 3:51 2-5		

Enormous enthusiasm prevailed on the termination of the race, Lancia especially, who had had charge of the engines

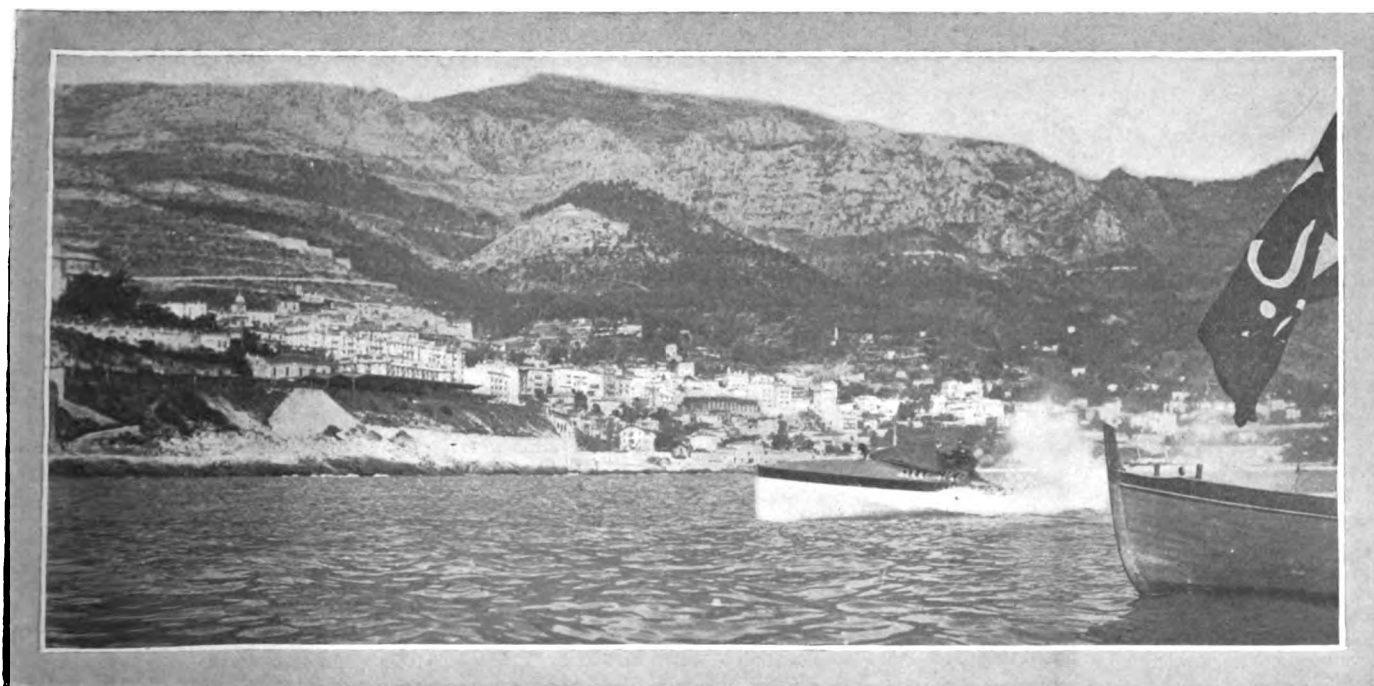
of *Fiat XIII.*, being enthusiastically cheered by the large crowd. The victory of the Italian craft is more remarkable in view of the fact that a few hours before the race the *Fiat* was in collision with the *Delahaye* and smashed in her bows so badly that she commenced to sink. She was hastily hauled ashore and put under repairs, the work only being completed about half an hour before the start of the race. *Delahaye*, being a solidly constructed steel craft weighing seven tons, was but little the worse for the accident, though the indent caused in her hull may have affected her speed a little.

Sales are reported to have been good during the meeting, quite a number of orders being placed for engines and hulls. Several of the racers changed hands, among them being *Antoinette IV.*, sold to M. Braunbeck, a German publisher, who will enter her for the Kiel regatta; the *Yarrow-Napier* was sold to Lord Montague, of Beaulieu; Chevalier Florio bought the *Cafit*, and Baron de Caters became the owner of the *Mercedes D. L.*

"THE RACE FROM FLAG TO FLAG."

From Miami on the Florida coast to Nassau, New Providence, is about 200 miles, and an auto boat event, to be known as "The Race from Flag to Flag," will be a feature of next winter's Southern automobile and power boat circuit. Of course W. J. Morgan is the man behind the idea, and he has just returned from a visit to Nassau, where conferences with Sir William Grey-Wilson, Governor-General of the Bahamas, resulted in promises of co-operation from that source.

It is planned to have the race open to the world, over a course that is out of a direct line taken by the vessels plying between the two ports. The contest has been given the catchy name of "The Race from Flag to Flag"—that is, from American to English soil. During Mr. Morgan's visit Sir Grey-Wilson called a meeting of the Government officials of the Bahamas and the project was thoroughly discussed.



FIAT XIII., LANCIA AT THE MOTOR, WINNING PRINCE OF MONACO CUP AND KILOMETER WORLD'S RECORD AT MONACO.

HELPFUL TO THE MAN WHO DRIVES HIS CAR.

General Troubles with Spark Coils.

Continuing the subject of "the peculiarities of the vibrating spark coil," given at brief length in the last issue of *THE AUTOMOBILE*, some of the general troubles encountered in coils by automobilists present a subject full of live interest to owners and drivers. *Autocar* (Eng.) from which we made quotations last week, amplifies the subject in its current issue with the following list of things commonly encountered by users of the vibrating coil:

Looseness of platinum screws in the bridges. Whether these are bound with a lock-nut or nut, they offer a resistance to the primary circuit.

Armature rubbing against the guide screw. This restricts the speed of the armature. Allowance is made for this in some armatures by making the hole in the armature through which the guiding screw passes slightly larger than the screw stem.

Shorting of the secondary current to the coil support angles or ears, due to the screws which hold the angles to the case being too long and projecting inside.

In the case of four-cylinder coils (not waxed in entirely) the ebonite top breaks away, owing to the screws which are passed through the case into the ebonite top chipping out pieces of ebonite, and so losing their hold of the top. This is very often caused by the windings getting loose, and may be caused by a jar to the coil.

Breaking of the primary wire between the communication screws on the ebonite top and the terminals, and between the communication screw and the bobbin itself.

Breaking of the flex wire between the bobbin (high tension) and the terminal.

Internal switch troubles, due to wax entering the switch and greasing the metal contacts.

Buttons on the armatures (which draw down the platinum blade) getting loose and causing erratic striking of the platinum blade. In the case of Castle distributor coils we have known this to be the cause of knocking in the engine.

Button of the armature shorting on the platinum screw.

Stiffness of distributor armatures—in those cases where it is of springy material and has no spring underneath to help its return movement. This stiffness causes misfiring at high engine speeds.

Instances have been known of coils bubbling the wax out, but in most cases this has been where ordinary coils have been used for distributor purposes. In several Basse-Michel distributor coils, with the bobbins waxed separately, all the insulation was off the bobbins and melted down to the bottom of the box. In tracing the cause of this, it was found to be due to the coil being placed inside the bonnet near the motor.

In large, heavy two, three and four-cylinder coils the wooden cases sometimes split, especially where angles are screwed to the wood. As an opposite example of this, a well-known French coil is made this year with the wood of the case and front flap a full half-inch thick. The top has hinges and the front flap hinges are much stronger than usual. Where flaps in covered-in coils are used, the hinges nearly always work loose, and the same fault is noticeable with the top lids. This is accounted for by the thin wood used in the case construction, which necessitates small screws being used to attach the hinges.

To Remedy a Leaky Carbureter Float.

The best way to locate a leak in a carbureter float is to place the float in boiling water, when the gasoline vapor and air will issue out in the form of bubbles. Care should, however, be taken to see that all gasoline is removed from the exterior of the float before bringing it within the proximity of a fire. After locating the leak and making repairs, at times a slight leakage will follow which is particularly hard to locate, and which is due to small porosities in the drum of the float. The permeating qualities of gasoline demands that these shall be closed, else the float will slowly fill again and lose its buoyancy in the float chamber. Should this fault make itself evident, treat the whole float with a coat of nickelplating. This will be found to be effective in closing the pores better than solder, and as it is evenly distributed by the plating process, the balance of the float itself is better preserved.

Working Pits for Private Garages.

An inspection and working pit that is suitable for all sizes of cars should have about the following proportions: Length, 9 feet; width, 2 feet 6 inches; and the depth should not be less than 4 feet. The bottom and sides should be properly bricked or cemented, the latter preferably on account of being more easily cleaned, and the floor should have a slight inclination toward one corner for drainage. Where it is possible to run a drain pipe from the bottom to an outside drain it should be done. The cover should be constructed of stout planks, two inches thick, each separate, so that any proportion may be removed as desired, and they should be fitted into a rebated frame. The above-described pit is very well adapted to private garages, and when the garage is ample enough to accommodate two cars, should be located on one side, so that when the cars are abreast one will be immediately over the pit. Another thing, the pit should be on the side of the garage nearest the light, so as to dispense with artificial light (unless it is electricity) as much as possible.

Mending Cracked Water Jackets.

A method of mending cracked water jackets that has given entire satisfaction is described in the *American Machinist* by W. L. McL., as follows: First, a strip was made about 3-16 inches thick and 1 1-2 inches wide, to completely cover the crack, following it wherever it went. This sometimes required nice blacksmith work. The patch was then clamped over the crack and the whole put under a drill. One-quarter-inch holes were drilled about half an inch apart along each side right into the jacket. The patch was removed and while the holes in the cylinder were being tapped, those in the patch were enlarged and countersunk. The strip was then riveted on and hot water with a liberal supply of brine was applied inside at 100 pounds pressure for three or four hours.

Shoulder on New Clutch Leather.

The cone of a clutch which has been fitted with a new leather may not be pushed all the way home in the flywheel drum by its spring owing to the thickness of the leather. In time the pressure and wear on the leather will leave a slight shoulder that may prevent the cone entering far enough to prevent slippage of the clutch. In a case of this kind the cone should be centered in a lathe and the shoulder removed with a file or sandpaper, after which the leather should be dressed with oil.

Importance of the Maintenance of Lubrication.

A very important element in proper care is the maintenance of sufficient lubrication, since it is lubrication that nullifies wear. A sufficient supply of oil must be fed uninterruptedly to all working parts. If the oil supply gives out, the piston will stick, which means an inevitable wait for the motor to cool while oil must be procured. When starting out, one should always investigate personally the supply of gasoline, oil and water, for no matter how trustworthy the man who fills the car, no one is infallible.

Tire Chains Should Go in Pairs.

It is obviously bad practice to attach an anti-skid tread or a tire chain to only one of the driving wheels of a car. While this may serve to give a little additional traction on muddy roads or wet city pavements, the tendency to side-slip is greatly increased owing to the difference in traction between the two wheels; while one wheel grips the surface the other spins around. It also strains the differential.

MASSACHUSETTS MAY RAISE THE SPEED LIMITS.

BOSTON, April 30.—The Committee on Roads and Bridges of the Massachusetts Legislature, having charge of the preliminary steps in all automobile legislation, has reported to the House of Representatives a bill increasing the speed limit from ten and fifteen miles to twelve and twenty in city and country, respectively. The bill also includes many other changes in the law, particularly in the penalties. It is based to a considerable extent upon the compromise bill which was reported by a sub-committee to the full committee, but it contains, in addition to the main features of the compromise measure, a number of new provisions which have not appeared heretofore this year in the suggestions for legislation, and which were not brought up at the hearings held several months ago. Some of the new provisions are in the interest of the automobilists, while others are of a restrictive nature.

The main point of an increased speed limit has been favored, and a statutory definition of the distance over which an automobile should be timed for the purpose of ascertaining if it is exceeding the limit allowed by law is also included. In the country sections, where twenty miles an hour is allowed under the bill, the "trap" must be a quarter of a mile long, while in the thickly settled or twelve-miles sections the "trap" must be one-eighth of a mile in length. The speed at corners, crossings, and curves is limited to eight miles an hour, and the bill contains, in condensed form, a paragraph defining the much-disputed phrase "thickly settled or business part of a city or town."

The punishment section of the compromise bill under which cases of unintentional violation of the law, or in which extenuating circumstances are shown, could be placed on file, has been amended by the insertion of a clause providing a fine not exceeding \$100 or imprisonment for a term not exceeding ten days, or both, for attaching a number plate to a car to which it does not belong, or deliberately obscuring the figures on a number plate with intent to disguise the identity of the machine. This is the same punishment as for operating a car after the revocation of a license or certificate of registration, the clause relating to which remains about the same, the only change being that when a person is convicted for a third or subsequent offense of this character and his license or registration or both are taken away, he cannot secure a new license or certificate of registration for thirty days. The former provision was for a suspension for fourteen days. Under the other part of the punishment section, where reckless driving is dealt with, the committee has included driving by a person under the influence of liquor, and the punishment is a fine not exceeding \$100 or imprisonment for not more than six months. A license or certificate of registration revoked under this clause cannot be reissued for at least sixty days. The former provision made the time thirty days.

Two new sections, numbered 6 and 7 in the bill as reported, appear to have been included for the benefit of the police. Section 6 reads as follows:

"Any person who, while operating or in charge of a motor vehicle, shall refuse when requested by a police officer to give his name and address, or the name and address of the owner of such motor vehicle, or who shall give a false name or address, or who, when signaled to stop by any police officer in uniform or who displays his badge conspicuously on the outside of his outer coat or garment, shall refuse or neglect so to stop, or who refuses on demand to produce his license to operate and his certificate of registration and to permit said officer to take said papers in hand for the purpose of examining them, shall be punished by a fine of not less than

\$25 nor more than \$100." Section 7 of the new act reads: "Any person who shall own or control a motor cycle, and who, when requested by a police officer, shall refuse or neglect to give any information which it is within his power to give, and which may lead to the identification or apprehension of the person who was driving such motor vehicle on the occasion inquired about, shall be punished by a fine of not less than twenty-five nor more than one hundred dollars."

A change which is in the interest of the automobilists is made in the part of last year's law relating to the establishment of special rates of speed by local authorities. The automobilists desired to have the right to make these special regulations taken away from the local authorities altogether, and their efforts were seconded by the Highway Commission. It was found, however, that there existed very strong opposition to any legislation which should deprive the towns and cities of any rights which they now possess over their own highways. The law has been amended, however, so that one of the most objectionable parts is eliminated. Under the law as it now stands a protest can be entertained by the Highway Commission against a local regulation only if it is made within fifteen days after the regulation had been promulgated. Because of the necessity of securing a certain number of signers to petitions, it was impossible in some cases for the automobilists to present their protest within the given time, and therefore the local regulations went into effect without being reviewed by the Highway Commission. In the bill which has been reported, the time limit for the presentation of protests is removed, and they may be presented at any time.

If the bill, as reported, is passed by the Legislature without amendment, the privileges of non-resident automobilists will be considerably curtailed. Under the present law, which was passed last year, they are permitted to operate their machines without a Massachusetts registration, and with the number plates of their home state for a period of fifteen days. In the bill now before the House of Representatives this time is reduced to seven days. Under the proposed amendment it would be practically impossible for a person registered in another state to use his machine in Massachusetts except for passing through, as the seven days would not be long enough for an extended visit. This is in line with the desire of the Highway Commission to bring all the automobiles in use in the state under its jurisdiction. This part of the bill is likely to meet with strenuous opposition from representatives from places which are popular summer resorts, for the necessity of a Massachusetts registration, if an automobile is to be kept here more than seven days, may act to keep away some tourists.

NEW JERSEY'S FEES TO BE OVER \$76,000.

TRENTON, N. J., April 30.—During the first month of operation of the new law, applications for licenses in New Jersey have been running from 40 to 60 a day. Under these circumstances Commissioner of Motor Vehicles J. B. R. Smith will have a difficult task to watch the applicants, and determine whether they are users of stimulants, and whether they are fit persons for registration under the requirements of the statute. It will mean a great deal of hard work to personally examine these applicants, and Mr. Smith will find that the new automobile law has vastly multiplied his duties in the Secretary of State's office.

Mr. Smith estimates the receipts under the law will be about \$76,000 the first year. The expenses of the department will be

about \$20,000, for which the Legislature has appropriated \$10,500, so that the total revenue to the state should figure somewhat more than \$60,000. The estimate of the receipts is based on the assumption that there are 17,000 motor vehicles in the state. A license fee of \$5 is charged for all over 3½ horsepower and of \$1 for all under that power. Making the average fee \$3 the total of \$51,000 from this source is arrived at. This is increased by \$25,000 by operator's fees.

WANT OBNOXIOUS LAW REPEALED.

NEW HAVEN, CONN., April 30.—Local automobilists are preparing a monster remonstrance which will be presented to the ordinance committee of the board of aldermen at its meeting next month. Their complaint is based on the following, which was passed by that body recently: "No automobile shall be kept or stored in any building that has not been licensed for such purpose by the fire marshal." This will prevent all those who own autos from keeping them in barns and sheds which have been erected for that purpose, unless a special license is secured from the fire marshal, and the petitioners will ask that the ordinance be repealed. As it now reads, electric and all other machines would be included. This section is a part of the general ordinances passed last year.

Foremost amongst the petitioners will be several members of the aldermanic body who are enthusiastic automobilists, and they will undoubtedly be supported by other members of this body, who will represent many of the most influential citizens of the city.

SPECIAL OFFICERS TO APPREHEND.

COLUMBUS, OHIO, April 30.—Chief of Police O'Connor, of this city, has a scheme to catch autoists who disregard speed regulations. He proposes that the patrolmen be provided with bicycles with speed indicators to follow the fast-flying automobilists and register their speed. In this way proof could be secured of the infraction of the law. "I believe that by the use of these speed measures we could punish many reckless drivers," says the chief. "The trouble is we can't get evidence. A policeman arrests a man whom he charges with exceeding the speed limit, and it is up to him to prove this. He has to estimate the speed roughly, and may be certain the chauffeur was going 25 miles an hour, but when he gets on the witness stand the lawyers for the defense will tie him up in a thousand difficulties, making it hard to get a conviction. So a policeman becomes wary about making arrests. We have even had as witnesses railroad men supposed to be able to accurately estimate speed, but still lost the case."

RHODE ISLAND LAW REMAINS SAME.

PROVIDENCE, R. I., April 30.—The Legislature wound up last week without the present speed laws being disturbed. This means that every city, town, and village will make ordinances according to the ideas of the town fathers. The majority of the country districts allow ten miles per hour, and no faster. In many sections preparations are being made to strictly enforce the law, especially in the southern part of the State. The cases, however, if carried to a higher court, usually result in an acquittal for the defendant.

Registration figures in this state show that the 1,600 mark is likely to be reached during the present week. Up to date 1,580 cars have been registered.

The Office of Works in London has again decided to exclude gasoline cars from Hyde Park during the fashionable hours of the afternoon, electric motor conveyances only being permitted. The drivers of such must, however, wear a special badge in order to permit the police to differentiate between the two types, as nowadays so many gasoline broughams and Victorias are being built with the engine tucked away out of sight.

FREE ALCOHOL BILL STILL IN DANGER.

WASHINGTON, D. C., April 30.—The outlook for the Payne free alcohol bill in the Senate continues dark, and it is very evident that the powerful interests that are opposing the measure have made progress in their campaign to defeat the bill. All kinds of tariff-reducing amendments are being prepared to tack on to the alcohol bill if it ever emerges from the Senate Finance Committee, where it now reposes. Advocates of the bill derived a crumb of comfort last week when Senator Lodge, chairman of the Philippines Committee and one of the leaders in the Senate, issued a strong statement in which he denied the report that he will offer the Philippine tariff bill as an amendment to the free alcohol bill, and also denying the report that he is opposed to the latter measure. His statement was in part as follows:

"I have always been in favor of the principles and purpose of the alcohol bill. I have favored the removal of the tax on industrial alcohol ever since 1888, when provisions to take the tax off alcohol used in the arts were embodied in the substitute for the Mills tariff bill, which Senators Aldrich and Allison reported to the Senate. I am most heartily in favor of the bill which has passed the House, and I sincerely hope it will pass the Senate before the close of this session. I should not only refuse to embarrass it by offering the Philippine or any other tariff amendment, but should resist any attempt of that sort so far as I personally could. The removal of this tax from denatured alcohol would be most beneficial to many large industries, to farmers who have largely petitioned for it, and to all who use explosion motors of any kind.

"There are only two interests which oppose the bill because they fear it would be injurious. One is composed of the makers of kerosene and gasoline, who think that grain alcohol free of tax would be a dangerous competitor, an objection which does not seem to me to be of importance. The other opponents of the bill are the makers of wood alcohol. I have no doubt that the removal of the tax from grain alcohol would put an end to the production of wood alcohol, which I regard as an unmixed benefit. Wood alcohol exists only by the injustice which imposes a heavy tax on grain alcohol and leaves wood alcohol untaxed. Either a tax should be imposed on wood alcohol, or, what is far better, it should be removed from grain alcohol. Great industrial countries like England and Germany are careful to relieve alcohol used in the arts or manufactures from taxation. We ought, without question, to have done the same thing long ago."

Coming from a man who is the acknowledged spokesman of the President of the United States on the floor of the Senate, this interesting statement from Senator Lodge is bound to be effective in many quarters, and the free alcohol advocates are consequently encouraged.

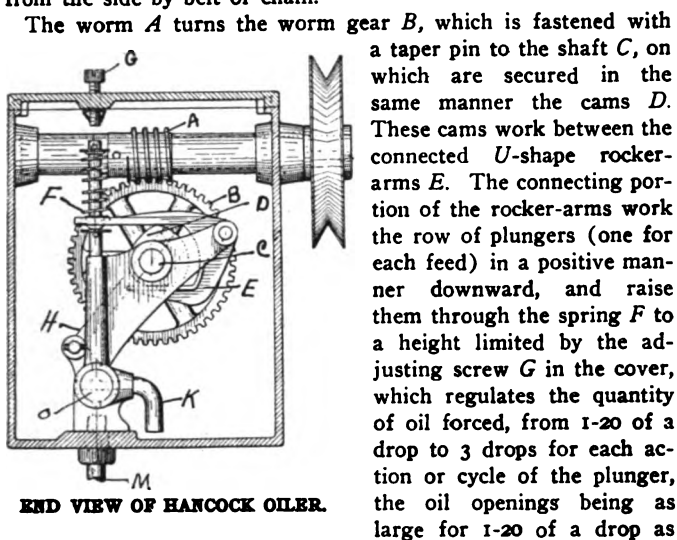
ORDINANCE CONTRARY TO STATE LAW.

SCRANTON, PA., April 30.—At the last meeting of the common council of this city, Councilman Partridge, who seems to be suffering from an acute attack of autophobia, introduced an ordinance regulating automobiles, placing new conditions on owners of machines in Scranton. The proposed measure limits speed to six miles an hour, to be reduced to five when approaching a crossing, a person walking or a horse. It also imposes a \$12 registration fee, requires lights to be carried, prescribes that gongs or other alarms shall be sounded, and that the driver shall stop when requested to do so by the driver of a horse; and imposes a penalty for the first offense of not less than \$10 or more than \$25, and for the second offense of not less than \$25 or more than \$100.

In his excessive desire to restrain the automobile and make its user subject to his will, the honorable councilman seems to have overlooked the fact that most of the provisions of his proposed ordinances are contrary to the Pennsylvania state law governing motor vehicles, which went into effect April 19, 1905, and is now in operation. Councilman Partridge has another guess coming.

A VALVELESS MECHANICAL OILER.

Hancock Valveless Oilers have been designed with a view to simplicity, positiveness and reliability, and the maker, the Hancock Manufacturing Company, 144 East Erie street, Chicago, asserts that it has accomplished all these desirable things in its product. By referring to the sectional cuts, which illustrate Type A, it will be seen that there is a noticeable absence of nuts, bolts, screws, balls, stuffing-boxes and packing in the working mechanism. They may be driven from either side or end, but preferably from the side by belt or chain.

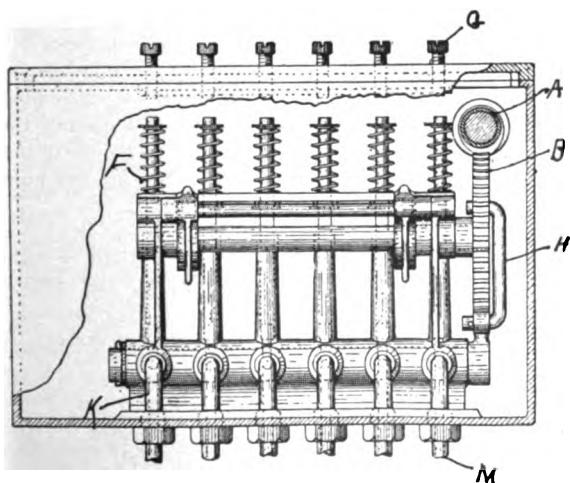


END VIEW OF HANCOCK OILER.

when 3 drops are thrown; sediment cannot close the openings. The screw G is held from turning by an automatic fastening. Directly beneath the plunger is a steel shaft O, which is ground and lapped to fit, and which is rocked 90 degrees back and forth by a strap H. This shaft is drilled with a series of T-shaped holes opposite each plunger.

As shown in sectional cuts, the plungers have just drawn in oil from the body through the inlet K. Governed by the shape of the cam, the plungers stand still until the long part of the T-shaped opening registers with the outlet M, at which time the plungers are depressed, forcing the oil to lead, immediately after which the shaft O rocks back, closing the outlet opening, and holding any pressure created by piston, which is increased by each succeeding stroke, until an enormous pressure is produced, which is sufficient to remove any obstruction in the lead pipes. It will be noted that the inlet K and outlet M cannot be opened at the same time, thereby preventing leakage. Bleeder valves are used with the Type A.

In Type B a sight feed is used, and the same principle of operating is retained, an extra set of plungers of slightly larger diameter being used. The oilers are well finished and have a practical working look about them.



FRONT VIEW OF HANCOCK OILER SHOWING MECHANISM.

PHYSICIANS AND AUTOMOBILES.

INDIANAPOLIS, April 30. — Automobiles have been given a thorough and practical test by the physicians of this city during the past five years, and after such an exhaustive trial there are no warmer friends of the motor-driven vehicle than they. Two score or more of the leading physicians of the city now use automobiles in their practice, a large number having displaced horses entirely. Some of the most prominent practitioners have two or three cars, one of which is always kept in readiness for an emergency call.

A comparison between electric and gasoline machines, relative to their practicability, would not be possible, for each has been given the same careful test and has its many adherents. It seems rather more a question of the fancy of the owner than of the real merits of one car over another, so far as local physicians are concerned. For instance, two of the leading physicians, Dr. George D. Kahlo and Dr. A. C. Kimberlin, are divided on the question, the former believing the electric best adapted to the use of the physician, while the other insists that it is the gasoline automobile with which the physician can hope for the greatest success.

Dr. Kahlo was probably the first Indianapolis physician to own an automobile, one of the early electric types; but after using it for two years he returned to the use of horses in his practice, declaring that the electric was not sufficiently developed for the practical use of a doctor. Two years later, however, he returned to automobiles and has been using one of the electric type for the last three years. His automobile is kept at a downtown garage and is delivered at his home each morning shortly after 8 o'clock. It is frequently not returned to the garage before midnight, and whether he is at his office, at home, or the house of a patient, the automobile is always standing in front of the place, ready for service. Besides an actual saving over the use of horse-drawn vehicles, Dr. Kahlo declares that he frequently saves several hours in a day.

Speaking of the cost, Dr. Kahlo said that his automobile cost him about \$35 a month, from \$20 to \$25 of which is for storage, cleaning, charging, and delivering, the balance being an estimate on repairs. Besides this, he estimates the need of a new set of tires each year. The automobile is used constantly, summer and winter.

As strongly in favor of the gasoline automobile as Dr. Kahlo is of the electric automobile, is Dr. Kimberlin, who uses a four-cylinder gasoline automobile designed for physicians. He says that there is great saving over the use of horse-drawn vehicles, besides which he is relieved of the often uncongenial companionship of a coachman. He estimates the cost of gasoline and oil at about \$10 a month, with the cost of repairs a most nominal sum. The secret of the unsuccessful experience of some physicians with the automobile, Dr. Kimberlin holds to be due to the fact that they are not acquainted with their machines. He keeps his automobile at home, and a man who is employed about the house and yard has been taught to care for the machine, but is never permitted to use it, for Dr. Kimberlin says once a man is permitted to use an automobile, he cares for little else besides driving it.

Dr. T. A. Wagner keeps three automobiles, two touring cars and a Knox runabout, which he keeps exclusively for winter use. Dr. R. F. Bigger owns two automobiles, both of the gasoline type.

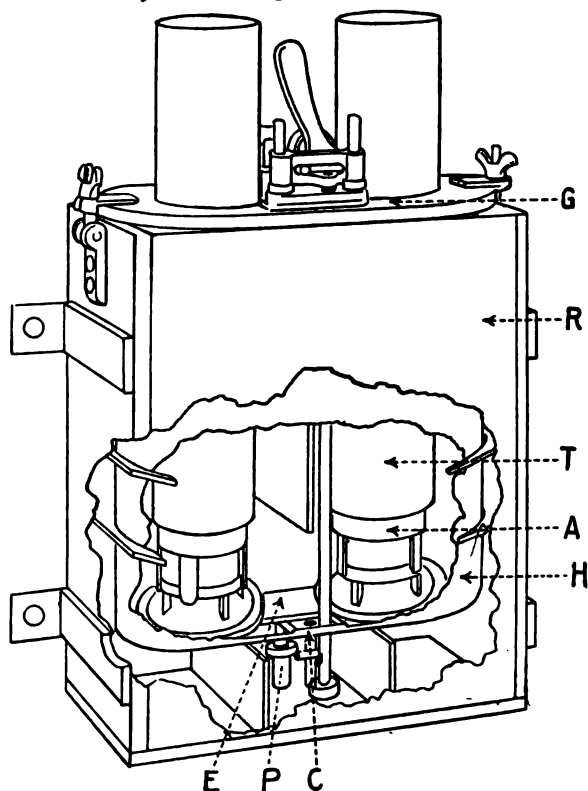
Some of them find another practical use for the automobile, as evidenced by the experience of Dr. B. A. Brown, who, besides being a practising physician, is surgeon for the Big Four Railroad and a member of the City Council. The Olds runabout he placed in service last year is used frequently in going to wrecks, and during his campaign for nomination and election to the office he holds, both campaigns were made in the automobile exclusively.

SOLID FUEL AND GENERATOR.

Acetyvone comes in the shape of sticks—cartridges—which are placed in a generator, adjusted according to directions furnished, and the result is an acetylene light for automobiles and other purposes. It is the patented product of the Acetyvone Company, with factory at Niagara Falls, N. Y., and offices at 38 Park Row, New York City, and its composition is a mixture of calcium carbide and foreign matter, forming a homogeneous mass, and molded into sticks of a suitable size. The principal and emphasized claim of its manufacturers is that only that determined surface which is automatically placed in contact with the water generates acetylene gas, the generation taking place gradually and in direct proportion to the consumption. Other advantages claimed are that the production of gas stops immediately the composition is removed from the water, thereby preventing gas accumulation; freedom from incrustations of residue; and simplicity of operation and control.

Illustrated in the outline drawing is the generator, the interior arrangement of which is shown in detail. The vertical tubes hold the sticks of Acetyvone. These tubes are double, *T* representing the outer tube, and *A* the inner tube, which holds the sticks of composition, and which rests on end on a grid at the bottom of *A*. The generator proper is in two parts, the shell *R*, or lower part, being the reservoir, and the upper part *G* being the generator proper. The gas is formed inside the bell *H*, only in sufficient quantity to feed the burner, and a steady flame is produced that needs no regulation, it is claimed, after being lighted. In operating the cock is opened by raising the lever *L*, and the carriage *C* allows the tube, or Acetyvone holder, to drop so that the ends of the sticks rest on the surface of the water. Gas is immediately generated into the bell *H*, from which it flows through a small pipe to the cock *L*, and thence to the burner.

The lamp is made to hold four sticks, which is the full charge, and which is designed to give six hours' light for two burners, either continuously or when lighted from time to time.



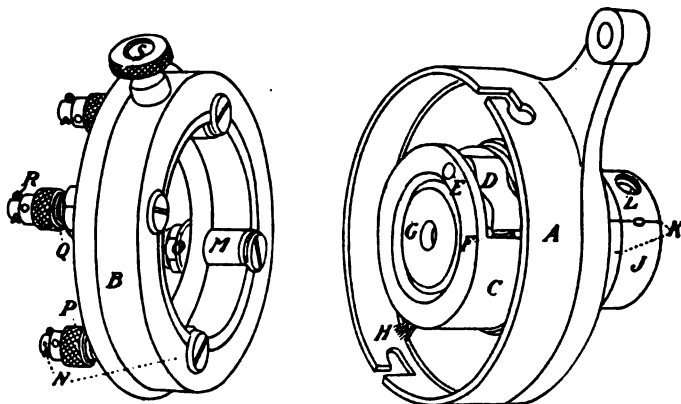
VIEW ACETVONE GENERATOR, SHOWING INTERIOR.

- A—Tubes, or acetyvone holders.
- T—Outside tube into which *A* is inserted.
- R—Outer shell, or lower part, forming the reservoir.
- G—Upper part, forming the generator proper.
- H—Bell, on the inside of which the gas is formed.
- C—Carriage, which holds up the tube *A*.
- E—Base connecting tubes, against which carriage *C* locks.

A COMPACT IGNITION TIMER.

Simplicity and durability are the cardinal virtues claimed by E. S. Youse, of Reading, Pa., for an ignition timer which he has produced, the salient points of which are described in detail below and illustrated in the line drawing here printed. It is marketed under the name of the "Perfect" timer.

The main body or casing of the timer, *A*, is made of aluminum and carries at its center the driving shaft, of phosphor bronze, upon which is mounted the ring *C*, which carries the contact-making finger *D*, pressed outward by the helical spring *F*. The



YOUSE IGNITION CURRENT DISTRIBUTOR SEPARATED.

A, main body or case of aluminum. B, pawl or insulating core of hard fiber. C, phosphor bronze spindle and contact carrier. D, hardened steel contact maker. E, retaining pin. F, helical spring. G, oil wick retaining cap. H, oiling wick. J, spindle-retaining collar. K, contact-indicating lines. M, adjustable hardened steel bushing. N, contact bushing stud. O, lock nut and washer. P, locking sleeve for wire terminal. Q, locking sleeve spring. R, locking sleeve cotter pin. S, spring-retaining cover locking device.

part *J* is the spindle retaining collar. A hollow space in the spindle or shaft is filled with oil and wicking; the cavity is covered by the cap *G* and the end of the wick projects at *H* and carries sufficient oil to keep the rubbing surfaces well lubricated. A hard fiber ring *B* fits into the aluminum shell or casing and carries the contact pieces, one for each cylinder; *M* is one of these contact pieces, which are hardened steel bushings, each held in position by a stud *N* fitted with a lock nut and a washer *O*. The locking sleeves *P* for the wire terminals are held firmly against the wires by springs *Q*. By the cotter pins *R* the wire-locking sleeves *P* are retained on the studs. A spring-locking device, controlled by the knurled nut *S*, holds the fiber ring *B* securely in its place in the casing, as the illustration shows. A disk of heavy glass set in the fiber ring closes the front of the timer, keeping the parts free from dust and dirt and retaining the lubricating oil. Lines indicating the commencement and the ending of the contact of the pawl with the contact pieces in the fiber ring are indicated at *K*. The necessary arm with an eye for connection with the regulating lever is made integral with the casing *A*.

This "Perfect" timer can be run equally well in either direction, the only change necessary when reversing the direction of rotation being the reversal of the pawl *D*, which is accomplished by removing the pin *E*, reversing the pawl and placing the pawl spring in the appropriate hole. This timer is regularly made for from one to four cylinders, and will be made for any number of cylinders on order.

The Motor Show at Budapest was unduly influenced by the then unfortunate political conditions, and suffered accordingly, Austria being very poorly represented. Th. Johnston, of the A. C. of America, was present at the opening ceremony.

The Italian Motor Volunteer Corps is gradually attaining perfection, as a series of regulations is being worked out by a special committee consisting of members of the various government offices.

THE NEWS OF THE AUTOMOBILE CLUBS.

The National Capital's Club Is Incorporated.

WASHINGTON, D. C., April 28.—The Recorder of Deeds has received a certificate of incorporation from the Automobile Club of Washington, and the latter is now a chartered body. The incorporators are the five officers of the club, W. C. Duvall, president; Col. C. E. Wood, vice-president; Leroy Mark, secretary; Otto J. De Moll, treasurer, and R. B. Caverly, captain. They will also constitute the Board of Trustees for the first year. The term of existence of the corporation is to be perpetual. The objects of the club, as set forth in the certificate, are to bring together persons who use automobiles in a social way, to secure proper legislation in the interests of automobiles, and to advocate the construction of good roads.

President Duvall, on the eve of awarding the contract for the construction of the club's country home, sent out a circular letter, setting forth the following facts: "The club has made very advantageous terms with the owners of the land upon which the house is to be erected; it will be equipped with every convenience, is splendidly located on the best road leading out of Washington, will be lighted by electricity, have plenty of porch room, the advantage of one of the best cafés, and altogether furnish a homelike place where members will always find a welcome and good fellowship. It is also contemplated to add a billiard room, tennis court, and possibly a bowling alley.

"Without any expense to the club, the Maryland Legislature has been prevailed upon to appropriate a large sum of money to construct a fine boulevard between Washington and Baltimore. A committee representing the club has successfully opposed and defeated the Sims bill before Congress, so that, instead of the speed of cars being lowered as provided in the original Sims bill, it has been raised by a Senate amendment, which we hope will go through both branches of the National Legislature. At the worst, the law will be left in its present state. In this manner are the good objects of the club being accomplished."

Plan to Lift the Speed Limit at Elgin.

ELGIN, ILL., April 30.—The autoists of this town have organized, and are endeavoring to have the speed rate raised inside the city limits. There is in force an ordinance that prohibits turning corners faster than four miles an hour, and six miles is the limit in the city. The owners of machines have set up the contention that four miles is so slow that it amounts to a stop, and is injurious to the machinery. Strange as it may seem, it is a farmer who is a prime mover in having this low rate raised. His name is J. P. Hornbeck and he owns a good machine. He came to town, loaded the chief of police into his car and proceeded to give the town a demonstration. The farmer and the policeman cut every corner in town, showing conclusively that four miles is a ridiculously low limit; that it is nothing more than a funeral pace. The farmer suggested that if the speed was to be kept in force, that the city band be called out to play the dead march in "Saul." The autoists have formed a working organization under the title of the Elgin Automobile Club, with L. B. Garrison president, and J. Thomas secretary. The club is expected to have a membership of 100. There are now 90 machines in town—machines ranging in price from \$1,250 to \$2,000 mostly are used. Last year the number of autos doubled, and there is expected to be quite an increase during the present season. Three Elgin women are good drivers. The farming fraternity is buying and is becoming more friendly to the automobile and its owner. One of the farmers owns a fine White steamer. Elgin is 37 miles out of Chicago on the Omaha line of the St. Paul road, and is the watch-making metropolis.

Albany Automobile Club's Second Annual Run.

ALBANY, N. Y., April 30.—Announcement is made by the tour committee of the Albany Automobile Club that the club's second annual tour will be started from this city, June 21, and will be of six days' duration, covering a distance of 454 miles. The tour, while under the control of the Albany Automobile Club, will be open to other automobile owners who wish to join. It is to be an easy stage run, as pleasure is the object most sought, and it will be through the more beautiful portions of New England with particular reference to the sections where good roads abound. The itinerary, as scheduled by the committee, is as follows: Thursday, June 21, Albany, N. Y., to Rutland, Vt., 96 miles; Friday, June 22, Rutland to Keene, N. H., 76 miles; Saturday, June 23, Keene to Boston, Mass., 88 miles; Sunday, June 24, in and around Boston, no schedule; Monday, June 25, Boston to Springfield, Mass., 101 miles; Tuesday, June 26, Springfield to Albany, 93 miles.

All participants in the run will be expected to stop at the above-mentioned controls each night, where hotel and garage accommodations will be provided. Speed limits are to be strictly observed. All doubtful turns are to be marked with confetti and a list of towns en route with the distances between will be furnished all drivers.

There will be an entrance fee of \$1 for each person participating in the tour, and in order that the committee may secure the best possible rates, entries should be mailed with entrance fee to the chairman of the tour committee, Matthew Van Alstyne, 372 Broadway, Albany, N. Y., on or before May 31.

Dead Horse Hill Climb Set for May 24.

WORCESTER, MASS., April 30.—Under the auspices of the Worcester Automobile Club, an automobile hill-climb will be held on Dead Horse Hill, Leicester, May 24. It is to be under the direct management of Chester I. Campbell, of Boston, who has managed Boston and Philadelphia automobile shows so successfully, as no member of the local club cared to attempt the undertaking. Whether or not the club has secured the permission of the Leicester authorities, who made things so unpleasant for Glidden tourists last year to hold the contest on Dead Horse Hill, cannot be learned. From the announcement it would appear that "Auto Jim" Quinn and his officers were to have nothing to say in regard to the climb. There is now a tentative list of twenty events, nineteen of which are for stock cars and one open to all vehicles. The climb will be held under the rules and regulations of the American Automobile Association.

Although the club members have not taken as much interest in the affair as last year, and it was confidently believed it would go by default, the sentiment during the past few days has been strong enough, it is said, to warrant the officials in selecting a manager.

Hoosier Capital's Club Now Has 100 Members.

INDIANAPOLIS, IND., April 29.—The Indiana Motor Club, recently organized, is growing rapidly. At a meeting held one night last week it was announced that the membership, consisting of forty charter members, had increased to 100 members, and that 150 shares of stock had been sold. The club is planning for a program of motor-boat races on Decoration Day, to be held at Broad Ripple Park, where the new club house will be erected. Complete plans have not yet been made for the events, but will be announced in a few days. The building committee of the club is still at work on plans for the club house, and as soon as completed, work will be started, and it is expected that the club house will be occupied early in July.

CLEVELANDERS CAN REGISTER AT HOME.

CLEVELAND, May 1.—Secretary Goddard of the Cleveland Automobile Club went down to Columbus last week and obtained the consent of Secretary of State Laylin to handling all the license tags and numbering under the new Ohio automobile law for Cleveland and vicinity through the Cleveland Automobile Club. The club rooms will be the headquarters for registration, and all operators, whether members of the club or not, can make their applications and secure their numbers in this way instead of sending to Columbus. Secretary Goddard will have copies of the new bill for distribution and will be able to explain the features of the new law to those who are not acquainted with it. This arrangement will be a great convenience to Cleveland drivers and it will be inducement for many strangers to call at the club rooms and get acquainted.

There is talk that there may be another session of the Ohio Legislature next fall, and in that event the Cleveland Automobile Club is planning to work through some changes in the present automobile law, and in good roads measures. One peculiar feature of the present Ohio law is that, while it was provided that the money acquired through licenses is to go to the good roads fund, no appropriation for its expenditure was made by the Legislature; and the money will accumulate until this can be put through.

Secretary Goddard has suggested that if there is to be another session of the Legislature it would be an excellent piece of work to take the Ohio Roads Commissioners on a little automobile junket through New York State, New Jersey, and Massachusetts, and show them the good roads in these States. It could be pointed out to the Commissioners, and to the people at large, that the money for these roads was raised by indirect taxation and that it did not fall upon the farmers or on the communities, as is the case in Ohio. If the farmers become interested in the advantages of the Eastern system, there would be very good prospects of putting through a law in Ohio similar to those in the Eastern States, and the work of road improvement could be carried on with more energy and more effective results.

Immediate improvement in the condition of a number of Cleveland's streets is demanded by the Cleveland Automobile Club. At a recent meeting President Sholes appointed a Good Roads Committee, consisting of W. P. Murray, E. H. Parkhurst, and W. L. Colt, and a campaign for street improvement has been actively inaugurated. The committee secured the assistance of the press, and, with photographers of the leading dailies, is making tours about the city, taking pictures of the worst places. These are shown up in the columns of the daily papers, with strong editorials calling attention of the city authorities to the bad condition of the streets. Investigation shows that, while the city is doing considerable work of repairing streets, much of it is of an inadequate character. Some particularly bad conditions were found along the Heights boulevards and in the park system, which have always been supposed to have fine roads. It appears, however, that some of the latest-made drives were improperly constructed and heavy teams have been driven over them in the winter until they are soft and full of ruts. All the facts will be presented by the committee in its report, and the club, with its 500 members, will make a vigorous shout for better conditions.

Rochester A. C. Has New Working Secretary.

ROCHESTER, N. Y., April 30.—H. Seymour Bentley has been elected secretary of the Rochester Automobile Club, and will in the future devote his entire time to the duties of his office. The new quarters of the club, at 25 Plymouth avenue, one-half block from Main street in the center of the city, are amply fitted up for the accommodation of members and guests. Tourists will receive a cordial welcome at all times, and the

secretary will be pleased to render any assistance in his power. The secretary's office is now connected with the surrounding country by telephone, and tourists in trouble are at liberty to call Main 4267.

At a recent meeting of the Board of Governors, President Harry S. Woodworth was re-elected as the club's director in the New York State Automobile Association, and the date for the annual meeting was fixed for May 10. Rochester motorists are waking up to the value of organization in furthering their interests—especially in the prevention of unjust legislation and the securing of improved streets and highways—and it is expected that the membership of the club will be doubled this season.

Numerous plans were discussed at the club meeting which will prove of special value to automobilists. It was decided to erect more signboards in the vicinity of Rochester and to have these of a more durable nature than those heretofore used. The club would be glad to have automobilists notify its secretary where signs are needed in this vicinity.

One of the most interesting matters discussed was the practicability of holding a fifty-mile road race over a twenty-five-mile course this fall. It was finally decided to submit the plan to the club. Syracuse enthusiasts have already pledged a large amount of money in case the event is held, and Buffalo automobilists are also very enthusiastic over the idea.

A resolution was adopted directing the secretary to write Mayor Cutler, calling his attention to the exceedingly bad condition of many of the asphalt streets and asking him to hasten their repair as promptly as possible.

Rockford's Club Is Prosperous and Active.

ROCKFORD, ILL., April 30.—There are 200 automobiles in this city, and nearly all the owners are members of the Rockford Automobile Club, a well-organized body of automobilists. Everett Baynes is president and Cary Dickerson secretary. There are three garages in town, and among the dealers all the leading makes are represented. During the present season there has been considerable changing from the lower-priced to the more costly machines.

The result of one case at law has turned out to the great advantage of a large number of automobile owners in this city. A driver who outraged humanity itself—crowded a man and his wife off the road, upset the vehicle, injuring both occupants, but never stopping to offer aid—has been worsted in a damage suit carried to the Appellate Court and will be compelled to pay \$2,000 damages. Decent, fair-minded auto-car owners are all saying, "Served him right!" and the decision has had a salutary effect all around.

CLUB DOINGS IN GENERAL.

CHICAGO.—At a meeting of the directors of the Chicago Automobile Club held last week, resolutions were adopted putting the club on record as unalterably opposed to reckless driving on the public highways and urging upon its members the utmost courtesy and consideration for other users of the road. Resolutions were also adopted stating that the club is equally opposed to the petty and annoying persecution to which some of the most careful and considerate members have been subjected in various localities through the laying of police traps and otherwise. An arrangement was made by the Board of Directors with Sidney S. Gorham to act as special counsel for members of the club who are arrested, charged with violations of the speed ordinance. Mr. Gorham will be prepared to furnish bail at any time.

BROOKLYN.—At the regular meeting of the Long Island Automobile Club, held last week at club headquarters on Cumberland street, it was formally decided to open the season with a tour of the borough, Prospect Park, and the boulevard. The parade will not be confined to members of the club, but every owner of an automobile in Brooklyn will be asked to participate. Date will be announced later.

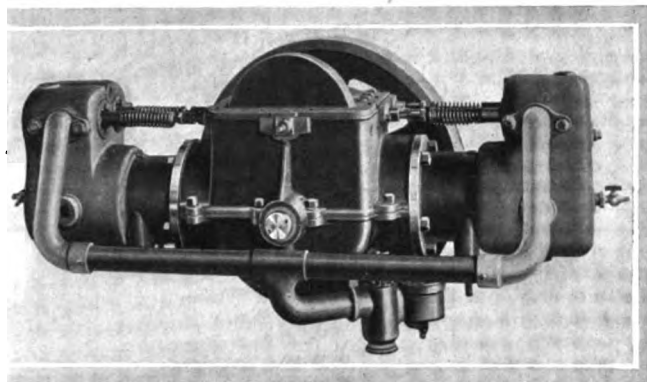
A SUCCESSFUL MICHIGAN DELIVERY CAR.

IN the line of light delivery cars, platform trucks, and sight-seeing 'buses, the Rapid Motor Vehicle Company, of Pontiac, Mich., has established an enviable reputation. These cars have passed successfully through the try-out stage, and are now being sold and operated extensively in many of the larger business sections of the country. The company has just moved into its new manufacturing plant, and after a brief time necessary to set its house in order, the output will be greatly increased, as orders are now waiting ahead of the ability of the factory to turn them out. This new factory is a large two-story building, 200x300 feet in size, built entirely of concrete blocks. Inside it is supplied with full machinery for turning out every part used in building cars, and it stands to-day as one of the largest and most complete plants devoted to the construction of commercial cars.

The Rapid people have not attempted to go beyond the 1½-ton wagon for the present season, preferring to keep within the field of what they consider will make the larger demands upon their manufacturing resources, as they say the tendency at this time seems to be for a wagon to take the place of the ordinary delivery and express wagon. The cars made by this company may be divided into five classes, in which two chassis designs are used, and may be enumerated as follows: An inclosed-top delivery wagon; an express-top delivery wagon with sides open, and protected with a strong wire screen; an open car, with regular wagon body, but without a top; a platform truck with "stakes," and a passenger or sight-seeing 'bus, with canopy top. These various wagons are made in two sizes, with different chassis

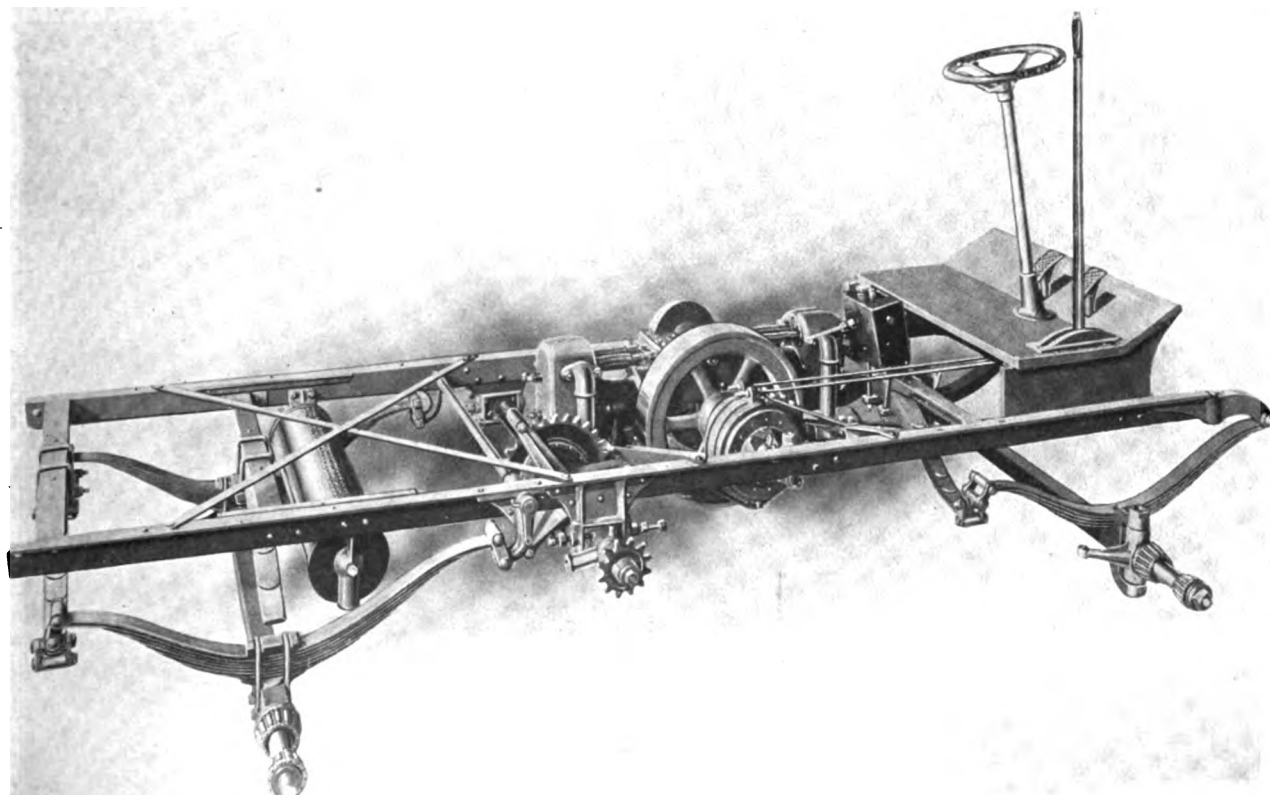
for each size, which are rated to carry 2,000 pounds and 3,000 pounds (paying load), respectively.

For motor equipment the horizontal two-cylinder is used. The cylinders are carried lengthwise on the left-hand side, with a continuation of the crankshaft at the right carrying the planetary gear set. The drive is from this by a single chain to the countershaft, and then by double side chains to



RAPID COMPANY'S MOTOR—DOUBLE-OPPOSED CYLINDERS.

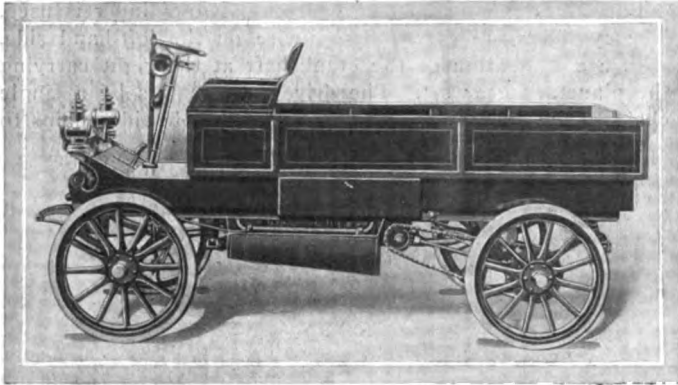
the rear wheels. The cylinders are of 5-inch bore by 5-inch stroke, and each is made with the cylinder wall, head, water-jacket, and valve-ports integral. The valves are mechanically operated. Jump-spark ignition is used. The transmission is of the two-speed and reverse planetary type and the final



CHASSIS OF DELIVERY WAGON MANUFACTURED BY THE RAPID MOTOR VEHICLE COMPANY, OF PONTIAC, MICH.

drive is by double chain. Steering is by wheel on top of slightly inclined column.

The wheels are the wood artillery pattern, 32 inches in diameter, and are equipped with three-inch solid tires. Wheelbase is 90 inches. Angle section steel is used in the frame, and a double platform spring suspension has been used. Agencies are being rapidly established, not alone in



RAPID DELIVERY WAGON WITH OPEN BODY.

this country, but in Europe as well. A number of cars were recently shipped to Italy, and a second shipment to Sweden will go forward at an early date.

NEW YORK CITY FATHERS PATRIOTIC.

Future purchases of automobiles by the City of New York for use by heads of the different municipal departments are to be confined to American makes of cars, under a resolution adopted last week by the board of aldermen. The resolution also fixed a maximum price of \$4,000 apiece for all machines bought. The resolution was adopted upon the recommendation of the finance committee. The board then authorized Dock Commissioner Bensel to buy two cars, one to cost \$2,500 and the other \$4,000. Hereafter all automobiles owned by the city must bear the initials of the department to which they belong, and must be used only for departmental business.

SOME NOVEL EXPERIMENTAL TREADS.

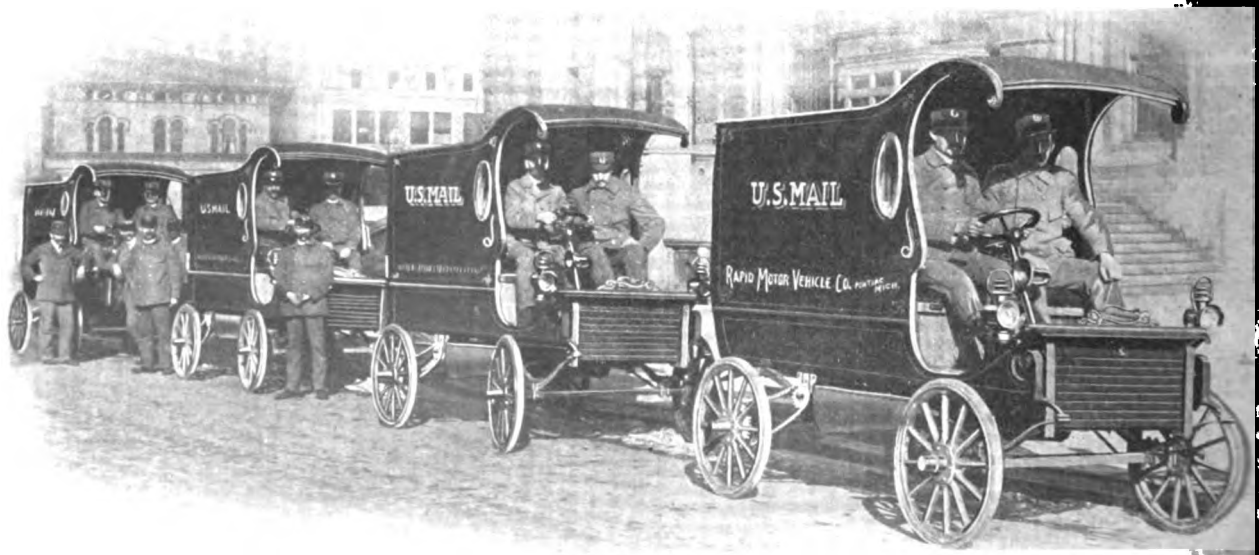
Many interesting experiments in special tire treads are being conducted in a large and well-equipped plant at 88 Gold street, New York, where the Healy Leather Tire Company not only manufactures and applies its steel-studded chrome leather covers for pneumatic tires, but is making a variety of special forms of anti-skid treads. The latest experiments are in the direction of a flat band of rubber 3-8 of an inch thick and three inches broad vulcanized to a strip of chrome leather which is riveted to the tread of the leather-covered tire. This strip is very flexible and has a slight concavity that creates a suction on the road surface sufficient to reduce very materially the tendency to side-slip and skidding.

Another special tread which is just now being experimented with is a modification of the foregoing. A leather envelope which is vulcanized to the tire shoe has a series of staggered brass shells attached to its tread. These shells are set in a double row and are about three-quarters of an inch in diameter by three-eighths of an inch deep. They are open at their outer ends and are packed full of a carborundum composition. The tread of the tire, then, has vulcanized to it a band of thick rubber perforated to exactly fit over the carborundum filled shells and comes flush with their tops. When the wheel rolls on the road the rubber is compressed and the studs are forced down hard upon the surface. If driving an asphalt or greasy cobblestone paving the sharp-edged carborundum prevents slippage, while on muddy roads the studs themselves serve the same purpose.

The Healy shop is equipped with all facilities to do a large business in all sorts of automobile tire repair work, as well as to put on any kind of tread wanted, but most of its work is in applying the Samson type of steel-studded, chrome-leather treads and the leather covers protecting the entire surface of the shoe, including the heads.

C. J. GLIDDEN IN COCHIN CHINA.

A postal card received from Cochin China reports the arrival there of Charles J. Glidden, on his around-the-world tour. From there he goes to China and Japan, whence he returns to New York, arriving June 19.

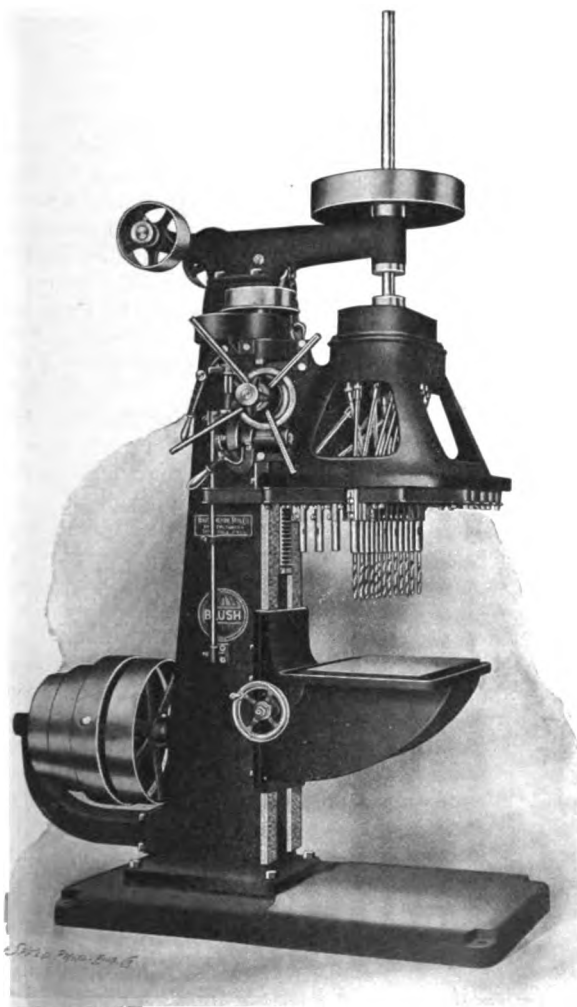


ALL READY TO MAKE MAIL DELIVERIES IN DETROIT WITH RAPID MOTOR CAR COMPANY CARS.

ADJUSTABLE MULTI-SPINDLE DRILL.

Designed and manufactured for the express purpose of the rapid drilling of automobile crankcases, cylinders, pumps, etc., and electrical slate work, a description of the new No. 10 multiple drill, manufactured by the Bausch Machine Tool Company, of Springfield, Mass., will be of interest to the manufacturing trade and others of our readers who are mechanically inclined.

The capacity of this machine is sixteen 3-16-inch to 1-2-inch holes in cast iron or steel, and it will drill sixteen 1-2-inch holes in cast iron, one inch deep, in twenty seconds. It is so designed that either high-speed or carbon drills may be used by means of a two-speed countershaft, and the capacity of the head, rectangular, is 16 by 20 inches. The machine can also be made with circular heads up to sixteen inches in capacity. All spindles are made of tool steel, running in composition bearings, which have for

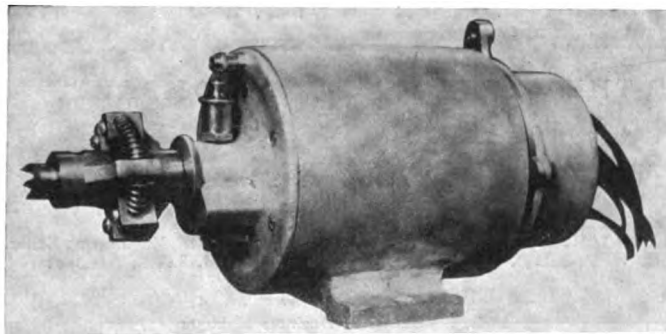


each spindle a vertical adjustment of 13-16 of an inch. The head is counterbalanced on post, and is operated by rack and pinion, and has three gear feed changes, which operate in connection with a quick reverse mechanism. The head has also an automatic knock off, which enables the operator to drill any depth required.

There is also an adjustable table on the post, which is raised and lowered for adjustment by hand, with a rack worm and hand wheel. The base of machine is planed so that in case long work is required to be drilled the adjustable table can be removed from post and the work rest on the face of the base. All bearings on this machine are composition lined, and all shafts and spindles are ground. The countershaft brackets have babbed bearings with ring oilers. The speeds of the countershaft are 450 and 550 r. p. m. Net weight of machine, with countershaft complete, about 3,600 pounds.

A LATE DESIGN IGNITION SYSTEM.

The Wilson Improved Ignition System, manufactured by the Drake Electric Company, 1344 Michigan avenue, Chicago, consists of modern design low-tension multipolar magneto, in combination with plain non-vibrator coil or coils, corresponding to the number of cylinders in use, which can be twelve if necessary, as



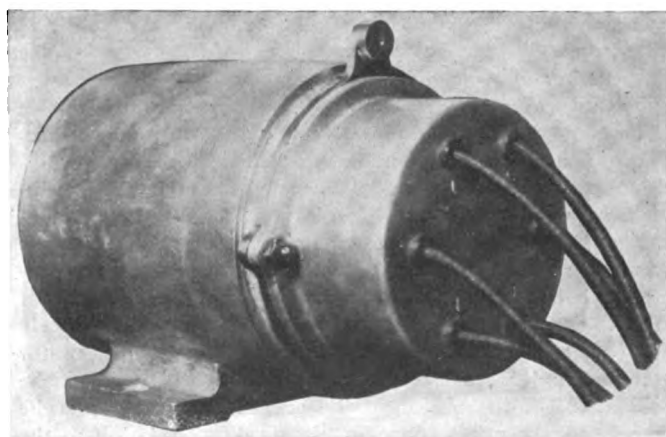
WILSON IGNITER AND CLUTCH TO CONNECT WITH CAMSHAFT.

the magneto has six poles and is driven direct by flexible couplings, same speed as engine shaft.

The timer is of the simple make-and-break type, having individual interrupting points corresponding to the number of cylinders in use, and is mounted on an outside extension of the field yoke, so the timing of the ignition is accomplished by shifting the fields in the magneto casing. The timer contact points are of large surface and mounted on plungers, which are actuated by piano steel compression springs, with the design of making them accurate at all speeds.

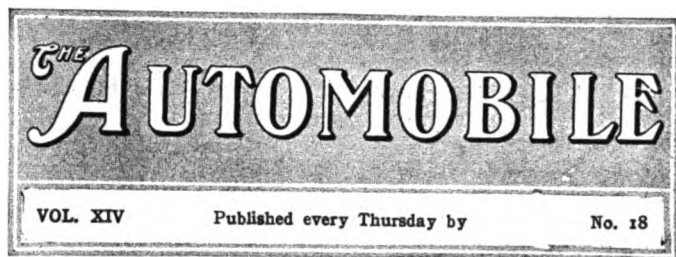
The coil is of special design and insulation to suit the wide range of speed necessary for motor cars and the consequent variation of the voltage produced in the magneto circuit, and is so constructed that the assembly and wiring is all accomplished in the top on the outside of the wax, making it very accessible and the different sections interchangeable, if necessary. The general construction of this ignition system eliminates vibrators from the coil and primary circuit and distributors from the secondary high-tension circuit.

An important claim set forth by the manufacturers is that the magneto is strictly a low-tension one, whose armature windings



WILSON IGNITER SHOWING WIRE CONNECTIONS.

are of very large wire, No. 13, B. & S., or about 3-32 of an inch in diameter, which makes the internal resistance of the armature very low, and makes it impossible to burn out the windings of armature with any output the magneto can give, or even a short-circuit, and is strong enough so that it cannot be broken or affected by vibration. The magneto is suitable for make-and-break or jump spark ignition on the same engine by using a double-throw switch in the primary or winding.



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The Puzzle of Horsepower Ratings.

In the automobile trade, for purposes of sale and exchange, the horsepower of a car is usually taken as the basis of cost comparison. There are exceptions to this, of course, as in the runabout class, in which it is usually assumed that the machine is equipped with a motor powerful enough to give satisfactory service. In the touring car class, however, the catalogue horsepower varies considerably for the same carrying capacity of a vehicle, not only as between one make of machine and another of similar size, but as between various models of an individual builder. The result is that the intending purchaser is often bewildered in reaching a conclusion as to what car to buy. In making the round of demonstrations he may find that one car of comparatively low horsepower will apparently give as good road service as one of a much higher rating. The reason is simple enough, for the catalogue horsepower (assuming that it is accurately given) almost invariably means the horsepower of the motor developed under brake test and without any relation to the employment of the motor in the propulsion of a car. The brake horsepower has consequently no direct relation to the effective horsepower—the power delivered to the rims of the driving wheels of the car. The difference between the two is made up of variables, such as relation of power to car weight (dead load), power economy of design of the entire plant, and mechanical efficiency of the latter, which may vary widely in machines of the same design with variations in accuracy of machining and care in assembling.

And even the demonstration is not at all a safe measure of power. Cars of exactly the same type will give widely different performances, under different conditions of trial which

may not be casually apparent. The weather, the condition of road surfaces, the kind of tires used, the quality of fuel, the skill of the driver, all have their influences on the result. For these reasons we are inclined to the belief that, no matter whether indicated horsepower, brake horsepower, or effective horsepower may be used in cataloguing cars, the result will never entirely meet the needs of the purchaser.

The present designation of cars is merely a "nominal horsepower" rating and answers its purpose as a basis of discussion or general comparison, just as did the nominal horsepower rating of tramp steamships in older days, which was merely a commercial classification for purposes of sale.

The moral is, do not purchase a car on horsepower rating alone. There are many other qualities to be considered, and almost any car in the market is capable of the legal rate of speed. The general reputation of a builder is frequently a more certain guide to satisfactory service than the horsepower rating.



The Strenuous President and the Automobile.

One would expect that the Chief Executive of these United States, because of his established strenuous disposition, would have taken to the automobile with unhesitating alacrity. But President Roosevelt has surrendered gradually, and even now his use of the motor-driven vehicle is more or less spasmodic. Only the other day, when the remains of John Paul Jones were laid away in Annapolis, the President arrived at the Naval Academy in an automobile, and, of course, used it on the return to the train which carried him back to Washington.

In France it has been an expected event for the President of the French Republic to attend the big automobile race of the year, and in Germany when the Gordon-Bennett race took place in that country, Emperor William was the most interested spectator of all. There is no question but that the Vanderbilt Cup Commission will invite the President to attend the race of next October, and should he accept he will see a strenuous spectacle that will fill his whole being with as much glee as he exhibited in climbing the heights of Santiago. This 1906 race for the Vanderbilt Cup will possess a field of powerful mechanical monsters such as has never before been brought together in this country nor excelled on the other side. The Elimination trial for the American cars, September 22, might be the event which the President would prefer to attend, though 'tis likely that his great interest in international affairs will cause him to select the five-cornered motor battle involving France, Germany, Italy, Great Britain, and America.



The Old Law of Cause and Effect.

The reckless automobilist unquestionably is responsible for the various intermittent outbursts of motorphobia that crop up here and there. But "two wrongs never made a right," and the fanatical manner in which police officials in city and country are embracing the opportunity of arresting every automobilist who exceeds in the most minor degree the exceptionally moderate speed limits is going to cause the pendulum to swing the other way in the near future. Persecution of law-abiding automobilists is becoming so marked in some localities that the fair-minded are protesting against this unfair discrimination, which makes the many pay heavy toll for the sins of the few, who should and could be singled out and properly fined and punished. The recent action of the Chicago Automobile Club and the dealers' association of that city in engaging special counsel to defend their members against unjust discrimination by police officials is a step in the right direction toward organized legal resistance to encroachment on the individual rights of automobilists.

HOW THE AUTOMOBILE HELPED IN SAN FRANCISCO.

HELPFUL is an inadequate word to express the prominent part played by the automobile in the earthquake that destroyed San Francisco and other parts of California. Immediately all the available automobiles in San Francisco were pressed into service, and many motor-driven vehicles afforded an avenue of escape from the burning city for their fortunate possessors. From the coast are coming the stories of what the automobile accomplished, and the valuable utility of the motor-driven vehicle was demonstrated in a most convincing manner.

Whitman, the Transcontinentalist, Was in the Thick of It.

The following from L. L. Whitman, the famous transcontinentalist, was received by the H. H. Franklin Mfg. Co., Syracuse, N. Y., graphically describing conditions after the shock:

left San Francisco this morning. We are 118 miles on our way, and if all holds together, hope to reach Los Angeles in a few days.

Yours truly, L. L. WHITMAN."

The above letter was dated Salinas, Cal., April 21, three days after the disaster. Salinas is a small town in Monterey county, some 118 miles south of San Francisco. The Franklin Company later received a dispatch dated April 26, advising that Mr. Whitman arrived safely at Los Angeles.

E. P. Brinegar's Story of the Calamity.

E. P. Brinegar, Winton representative in San Francisco, sent the Winton Company, at Cleveland, O., the following thrilling description of conditions in the stricken city and the good work accomplished by automobiles in ameliorating conditions:



A REMINDER OF POMPEII PERVADES THE VICINITY OF THE RUINS OF SAN FRANCISCO'S \$5,000,000 CITY HALL.

"I sent a telegram to you to-day, but it may be delayed in transit. With my wife, I escaped from the destroyed city of San Francisco after three days of awful wreckage and horror. I got out the old, faithful transcontinental car, threw away the hamper, and carried fleeing people to Golden Gate Park, where thousands slept in the open and watched the destruction by fire after the earthquake had shaken the city.

"The panic of the people was terrible. Martial law was enforced and the soldiers from the Presidio held the city. Many were shot for not obeying orders. I had a rifle shoved in my face by a soldier while I was after people in my Franklin. One driver who refused to obey was shot in his machine. The police pressed into service any automobile they wanted and drove them till they lay stranded in the streets. I can't begin to describe the awful scenes. I put my trunk on the Franklin and, with my wife,

"I presume you are anxious to know of the situation here. Can outline the matter by saying that hell could not be compared to San Francisco at the present time. Our building was within 100 feet of the dead line when the fire stopped. The building was damaged but slightly, being a wooden structure with metallic lath and plaster on the outside. The police and army officials have taken all our automobiles, old and new, and placed them in the hospital and other service; also confiscated parts, tires, gasoline, etc. We are glad, however, to be able to render this service to aid the suffering. I want to say here that without the aid of automobiles the suffering would have been ten-fold, and the loss of life probably much greater. Every available machine has been working day and night, and the owners of cars have done most heroic work. Most of the boys have seen no sleep since the hour of the earthquake. At least 100,000 people are camped

in Jefferson Square, just across the street from our building. The great work done by the automobile in connection with our disaster proves afresh the wonderful adaptability of the self-propelled vehicle. The people of San Francisco will forever bless the men who made the automobile a reality."

What a Woman Saw of the Disaster.

Mrs. G. A. Hawkins, wife of the San Francisco manager of the White branch, wrote from Felton, eight miles from Santa



CAMP-GROUND FOR DESTITUTE EARTHQUAKE VICTIMS.

Cruz, as follows to the White Sewing Machine Company, at Cleveland:

"I telegraphed you yesterday from San Mateo. They would take but ten words. The garage in San Francisco is burned. Automobiles were saved. Your loss is comparatively small if the banks remain solvent. The city, except for the residence portion west of Van Ness avenue, north to the bay, and around the park, is destroyed by fire. The houses standing are scarcely tenable. Ours lost only chimneys, but we left it at once, taking what we could in an automobile to the new house building on the boulevard. We camped there until midnight Thursday. Then Mr. Hawkins became alarmed for the personal safety of the women of our camp. He decided, if possible, to move the automobiles from the temporary station in the Golden Gate Park to Oak-



STREET SCENE SHOWING RUINS OF BUSINESS BLOCKS.

land, communication there having been established. He insisted that I come down here, establish a camp at a friend's ranch, where any one he sends can be cared for, and where I could get into communication with the world outside. I can communicate with him at Oakland. We have a machine and a chauffeur here who will go back to Oakland as soon as necessary. Gasoline is scarce, and oils. Our man was burned about the hands; otherwise no one of the company's employees was hurt.

"All automobiles and wagons possible are taken for military purposes. Your automobiles were in use constantly so long as gasoline permitted, carrying dead and wounded and dynamite.

"Last night here we had our first *real* meal and slept in a partially wrecked house. Everything is reduced to the most primitive state. We have milk and potatoes and smoked meats—luxuries just now.

"If the authorities turn Oakland into a camp, no garage arrangement is possible there. Mr. Hawkins then thought of San Jose, not knowing it is worse off than Oakland. Los Angeles did not suffer, and will probably be his next objective point. The manager there, Mr. Ryus, and Walter White came up to San Francisco in an automobile. I met them on our way downtown yesterday. I did not then know no one could enter the city on that side. They may have got in as far as Golden Gate Park. There the machines may have been seized for military use. You will hear from Mr. Hawkins direct as soon as he is able to communicate. All men have been working since Wednesday morning, with little food and sleep. No one has money. Our host here is well known, and so can get credit. Mr. Hawkins is exhausted, but, though he was weak from his recent illness, exposure has not made him worse. I expect him to collapse temporarily when the strain is lifted. I cannot see any business possible to be done in San Francisco for months, perhaps years. Everything had been unusually prosperous there. Men who counted themselves millionaires Tuesday have lost business and home and property value."

The Experiences of L. H. Bill.

Thomas B. Jeffery & Company, who maintain a branch establishment in San Francisco, were for several days in a state of anxiety over the whereabouts and conditions of their representatives at that point.

Early newspaper reports showed conclusively that their establishment had been entirely destroyed, and no word was heard from their branch manager, L. H. Bill, until the following Monday. Owing to sickness in his family, Mr. Bill had been temporarily residing at Hayward, about twenty-two miles out. He immediately endeavored to get into San Francisco, and by noon of the 18th succeeded in reaching Oakland, but all efforts to reach San Francisco were unavailing, as no one was allowed to enter the city. Mr. Bill's first definite information was obtained about noon on the 19th, when he learned that the Market street store was completely burned out.

Owing to lack of room it was impossible to keep the entire stock at the Rambler garage, and on the morning of the disturbance fourteen cars were at 1331 Market street, eleven at Freed's, on the opposite side of the street, and fourteen at a warehouse on Bluxome street. On this stock was carried an insurance aggregating \$32,800. At the same time there were in the hands of the freight company one carload of delivery wagons and one carload of model 14s. These were destroyed by fire, as were all the cars on Bluxome street and at Freed's bicycle store. Fred Linz, of the San Francisco store, reported to Mr. Bill on the morning of the 20th that during the night the garage on Market street and Freed's place were entirely destroyed by fire. He also reported that the cars at the garage had previously been removed to a safe place near the Park Panhandle.

Upon receipt of this report Mr. Bill attempted to send men in to get these cars, but none of them returned, and he learned that both men and cars had been impressed by the military. The new store and garage at Nos. 125-131 Golden Gate avenue was dynamited in an attempt to stop the spread of the fire. On the 21st Mr. Bill succeeded in reaching the wreck of the Market street store, but was not allowed to enter. A temporary office has been opened at 421 Ninth street, Oakland, and a shipment of new cars and a full supply of parts is already on the way.

How One Man's Car Arrived in Time.

There have been some interesting stories of marvelous escapes from the city of San Francisco. In many of these the automo-

bile has figured prominently. Mr. and Mrs. C. E. Maud, of Monterey, Cal., had gone into San Francisco the day previous to the earthquake for the purpose of attending the grand opera. They were guests at the Occidental Hotel at the time of the disaster, and in looking about for a means of escape from the city they thought of the Franklin car they had recently ordered of G. A. Royer. On going to the garage, located on Golden Gate avenue directly back of the City Hall, they found that the new Franklin had arrived. Hastily filling it with oil and gasoline, they



FRESH MEAT STATION AND CROWD OF THE HUNGRY

hurried out of the city, and as they left fires were springing up and raging in several sections. In some places after they reached the open country it was necessary to secure planks in order to bridge fissures in the ground made by the earthquake. Arriving at Santa Clara, Mr. and Mrs. Maud found their only son safe at Santa Clara College, and they proceeded with all dispatch to Monterey, which was reached after an eight-hour run from San Francisco.

Diamond and Goodrich Branches Were Destroyed.

Both the Diamond and Goodrich branch houses were destroyed. Manager Mathewson of the Diamond branch wired that all the employes of the company were safe, but later the company received another message inquiring whether anything had been heard of other members of the force, indicating that some of the



WAITING IN LINE FOR BREAD AND PROVISIONS.

employes had not been accounted for. The Diamond company maintained a small manufacturing plant to take care of the requirements of the coast trade. The building did not belong to the company, but the machinery and stock were valued at about \$75,000. The stock and goods in the Goodrich company's branch were valued at \$100,000, fully covered by insurance. The Goodyear Tire & Rubber Company maintained an agency, and its loss was only about \$1,500.

Mr. Thomas of Buffalo on California.

E. R. Thomas, the well-known Buffalo manufacturer, narrowly escaped being caught in the San Francisco calamity. He returned to Buffalo last week, grieved at the affliction of 'Frisco's population, but very enthusiastic over the beautiful automobile roads, splendid climate, and beauties of California.

"California is certainly an automobile paradise," says Mr. Thomas. "Three hundred days of the 365 the weather and roads are splendid for automobiling. In fact, the roads, by comparison, with the exception of New Jersey and Massachusetts, are far superior in general to the roads in the Eastern States. The road scenery in an automobile from Los Angeles to San Diego, I believe to be the grandest on this continent. Another fact that attracted my attention was the general courtesy extended by the farmers to automobilists. They would generally give them a fair share of the road to pass, and, instead of a scowl, would meet them with a smile. Mr. Thomas left San Francisco on the last train previous to the earthquake.

L'HOMMEDIU BILL IS DEAD.

ALBANY, N. Y., May 2.—The L'Hommedieu bill is dead. The Committee on Rules of the Assembly by a vote of 4 to 2 has declined to report the measure. The New York State Automobile Association did not make any great effort to have the bill reported, being satisfied to accept for the time being the present law.

ALBANY, N. Y., April 30.—An automobile event of last week was the ordering out of the L'Hommedieu auto-tax bill for amendment into an auto-additional-registration-fee bill, and its reprinting and recommitment to the Rules Committee. The measure has been considered, and there has been some discussion of its provisions by the Rules Committee and a reference of it to the Secretary of State to ascertain what it was estimated the cost of collection of the registration fee or tax would be in extra clerical force, etc. All of this has been under the secrecy of the Rules Committee deliberations, and it is not positive that when the Rules Committee gets the reprinted bill back on Tuesday the bill will be reported. The time is getting short, as the Legislature has adopted its final adjournment resolution and fixed the date of the last session for next Thursday. If the amended bill gets out of the Committee on Rules by Tuesday or Wednesday, and is passed then by the Assembly, it will be lucky. Then it must go back to the Senate for concurrence, where it will be likely to run into the fight over the mortgage tax bill and have a hard time getting any kind of recognition; even if it misses that bill, the end of the session is so near that Senators will be too anxious over what local legislation they may have left to permit anything to get in ahead.

PLANS FOR THE 1906 A. A. A. TOUR.

The 1906 A. A. A. tour will have its beginning in Chicago, but the rules that will decide the possession of the Glidden trophy will not be operative until the cavalcade reaches Buffalo, though there will be trophies for the Chicago-Buffalo section. In the 1,100 miles run from Buffalo to Bretton Woods, N. H., there will be other cups in addition to the Glidden trophy. The route will be across New York State to Burlington, Vt., thence to Montreal, to Quebec, and down to the White Mountains country.

It is probable that the starting date from Buffalo will be July 20, with the beginning at Chicago several days previous. All this was decided upon at the first meeting of the new Touring Committee of the A. A. A., held Tuesday afternoon at the club-rooms of the Automobile Club of America in New York City. Present at the session were Chairman Paul Deming, President Farson, Secretary Gorham, and Messrs. Dill of New Jersey, Myers of Chicago, Hower of Buffalo, Beach of Hartford, and Post, Hedge and Fitch of New York City. A sub-committee on rules was named, to consist of Messrs. Myers, Hower, and Gorham, and Messrs. Dill, Post and Hower will consider the route. It will be remembered that Mr. Dill two years ago made a run from his home in East Orange, N. J., to Quebec.

ACTIVITY IN "GASOLINE ROW."

PHILADELPHIA, April 30.—Activity, spelled with a big A, was the feature of "Gasoline Row" during the past week. No six business days since the advent of seasonable weather have witnessed so many deliveries of new cars to customers. The factory people seem to have "loosened up"—much to the relief of many agents and branch house managers who have been compelled to do some hard talking to put off threatened cancellations of orders. Garage and salesroom employees will surely insist on an eight-hour day if last week's conditions obtain for any length of time. In many establishments the business day ended along toward midnight, and this was continued all week. This week promises a repetition of the rush.

The Quaker City Automobile Company delivered no less than sixteen cars during the week — Pope-Toledos, Franklins and Pope-Hartfords. The Keystone Company turned over nine Autocars to new owners. A score of Ramblers relieved the pressure on Manager Smith and his force of helpers; but unless a similar invoice arrives this week he will be dodging impatient waiters. The Motor Shop distributed a carload of Royal Tourists last week. This is the story all along "the Row." Nor is there any lack of new orders. Many an agent and branch manager along North Broad street last week filed orders for cars which he cannot hope to deliver before August—if then. A prominent "Row" man was heard to predict that 90 per cent. of the year's business will have been done by June 1. After that—a rest.

The Hamilton Automobile Company, which added the Queen car to its line when it became apparent that the demand for Stoddard-Daytons could not be met, is reaping the reward of its foresight. Patrons who contracted for the latter are offered Queens—with delivery within ten days as an incentive—and many of them have agreed to the transfer. Such transfers are frequent in other establishments, and show the wisdom of an agent handling at least two good cars.

The Aldine Garage, a big affair at 2028-2030 Sansom street, back of the Aldine Hotel, is the latest addition to the city's storage places. Henry A. Rowan, Jr., manages it, along with several similar plants and repair shops in other sections.

The Gale runabout has just been added to the list of cars represented in Philadelphia. The South Broad Automobile Company, 729 South Broad street, will handle it.

Charles Strauss, local agent of the Indian motorcycle, at Carlisle and Oxford streets, has added the Yale to his line.

The C. E. Bradley Motor Company, of 258 Diamond street, is disposing of its new two-cylinder 6-horsepower Bradley motorcycles as fast as they can be turned out. The company contemplates an enlargement of its plant to accommodate the increasing business.

The Morton Marine Motor Company, of Third and Milton streets, Camden, is also about to enlarge its plant, the demand for the Morton, 1906, motor having been so great as to render such a move imperative.

THE CLIMB OF "GIANT DESPAIR."

Next in importance on the automobile calendar will be the climb of the mountain at Wilkesbarre, Pa., known as "Giant Despair." This contest will take place on the morning of May 10 and will be a part of the Centennial Jubilee of Wilkesbarre. The entry list closed to-day with an excellent array of cars of all kinds, and W. J. Morgan, who is assisting the Wilkesbarre Automobile Club in the promotion of the climb, predicts that it will rival in importance the famous Mount Washington ascent, Wilkesbarre being so easily accessible to innumerable automobilists from Pennsylvania, New Jersey, and New York.

Arrangements have been made to insure all competitors in the Herkomer competition against liability, fire and accident losses. A sum of 50 marks has to be paid by all starters on receiving their number plaques at Frankfort, and this money entitles them to the insurance, should anything occur.

TURNED THE FIRST SPADEFUL OF EARTH.

BUFFALO, April 30.—By turning up the first spadeful of earth, Saturday afternoon, George N. Pierce personally started the actual work of the construction of the new mammoth plant of the George N. Pierce Company, at Elmwood avenue and the Belt Line crossing.

The company has acquired fifteen acres of land on the site of what was once a corner of the Pan-American Midway. About six acres of the property will be put under roof, providing facilities for building the Pierce cars "from the ground up."

The work of building will be rushed with all possible speed. Within ninety-five working days part of the plant is to be ready for the installation of machinery, and eleven days later, under the contract, the plant will be complete. Three great operating buildings are to be erected. The largest will be known as the manufacturing building and will be 401 feet long and 326 feet wide. It will be one story high, with saw-tooth glass roof, affording daylight in every part of the building.

The second structure will be the assembling building, 160x401 feet and two stories high. The third will comprise a series of shops, the boiler and engine rooms, and is to be 55x376 feet in size, two stories high. In addition, there is to be an office building with a large dome surmounting it. This will be 60x250 feet and is to be called the "Good-will Building." It is to have two stories and a basement, the basement to be given over to lockers and storage for bicycles. The ground floor is designed for the offices of the heads of the departments, and the top floor is for entertainment, either of visitors of the company or the employees. A thousand men will be employed in erecting the buildings, which will be constructed of reinforced concrete.

When President Pierce turned the first sod, on Saturday, there were present Vice-President Henry May, Treasurer Charles Clifton, Secretary L. H. Gardner, and Directors George K. Birge, W. H. Gardner, and William B. Hoyt. Among the others present were George E. Matthews, Thomas Cary, Percy Pierce, F. S. Dey, E. C. Bull, Charles Sheppy, F. B. Humphrey, and J. L. Costello, representing the contractors, the Trussed Steel Company, of Detroit, and others.

"MOUNTAINEER" DISAPPOINTS DES MOINES.

DES MOINES, Ia., April 28.—Within twenty miles of Des Moines, the Reo *Mountaineer* went into the ditch to avoid a mud hole of unusual depth and in endeavoring to get back into the roadway, one of the transmission gears gave way. While there are in our repair box, which we send by express, all such parts, we have had so little call for repairs that the box was left somewhere back in New Mexico and, despite a liberal use of Western Union wires, has not been located. Meantime, we sent to the factory for the spur gear wanted, and it has just arrived.

The Iowa Automobile Club had made extensive arrangements to entertain us upon our arrival in Des Moines, even including a banquet at the Savary Hotel. The members were called together at 4 o'clock Sunday afternoon and, accompanied by a large number of auto owners who were not members of the club, they scoured the country in the vicinity of Des Moines in an effort to locate the *Mountaineer*. Upon discovering the nature of the break in our machinery, I tried to get the club by long-distance telephone, but after an hour's fruitless effort was obliged to give it up.

Of course, being automobilists, most of them have gone through like experiences themselves and realizing our position, freely forgave our absence, but I don't think the Sears-Nattinger Automobile Company, local agents for the Reo cars, will ever forgive us. The company had run an advertisement in the Des Moines papers inviting the public to call at the garage and inspect the *Mountaineer*, and the public did call and has continued to call all the past week.

PERCY F. MEGARGEL.

NOVEL CONTESTS FOR THE OPEN-AIR SHOW.

AN elaborate program, consisting of fourteen events, to be held at Empire City Track, May 24, 25, and 26, in connection with the first open-air automobile show and carnival, under the auspices of the New York Automobile Trade Association, has been issued by the committee in charge of the arrangements.

All the contests scheduled are for stock cars, as per makers' catalogue specifications, although, if desired, lamps, baskets, tops, and mud-guards need not be carried. Where passengers are carried, they must weigh not less than 140 pounds each if they are men, and not less than 120 pounds each if they are women.

Classification of cars entering the contests has been made as follows: Class A, one-cylinder; class B, two-cylinders; class C, four-cylinders; class D, six or more cylinders; class E includes all steam-propelled cars whose horsepower shall be determined on accepted standard formula. This class may enter in all events except where specified otherwise. A list of the events, together with the rules governing same, is appended in detail, as follows:

Rules Governing Competitions in Various Contests.

Flexibility Contest—Open to stock touring cars equipped as sold for four passengers or more, and classified as follows: Classes A, B, C, D, and E. One mile with flying start on a high gear. One-quarter mile with flying start on a high gear. Slowest speed without stopping motor or disconnecting clutch. Not less than two persons to be carried; one to be an official observer. The prize is offered for best percentage obtained by dividing the highest speed by the slowest on high gear and result divided by horsepower and fast speed, by low speed divided by horsepower.

Efficiency Test—The standard to be figured on cylinder displacement as one pint per horsepower hour on standard formula; 1-10 of the cubical displacement. Example: As cylinder 4x5 equals 60 cubic inches, times 4 cylinders equals 240 cubic inches equals 24 horsepower. One pint standard gasoline reservoir will be supplied by the committee with proper attachments to dash. Contestants must be prepared to attach connecting 1-4-inch hose to carbureter. The prize will be given for the highest percentage of the greatest distances traveled per horsepower hour. For classes A, B, C, D and E.

Power Test—Starting on low speed 10 yards from sand pit in which the depth increases gradually. Prizes will be awarded to car in each class covering the greatest distance. For classes A, B, C, D, and E.

Traction Test—Horsepower to be determined as in previous event. Prize to be given for the car making the best performance per horsepower hour per ton mile; based on the following formula: Weight multiplied by speed, divided by time multiplied by horsepower. This test to be run in two events, one for touring cars and one for commercial vehicles. For classes A, B, C, D, and E.

Brake Test—Test 1: All touring cars claiming 40 miles per hour or better, to be given 1-2 mile start and travel marked 1-8 mile in less than 111-4 seconds, when brakes will be applied. Minimum distance to count. Brakes must not be applied until car reaches brake line. Cars to be given two trials. Observer to be carried in each car. Test 2: The same rule for all touring cars claiming not more than 30 miles but over 24 miles per hour. Must do 1-8 mile within 183-4 seconds under same conditions. For classes A, B, C, D, and E.

Vibration Test—All gasoline touring cars eligible. Will be required to carry standard pail supplied by committee filled with water on any part of car floor selected by owner. Prizes will be given for car covering 300 yards, standing start, with least amount of water spilled. Car must be traveling on high gear before crossing finish line. For classes A, B, C, and D only.

Tug-of-War—This event shall be open for all kinds of cars on challenge, which the committee will hold and referee for all acceptances. The only rule being that cars shall be provided only with any regular and standard make rubber tires. All challenges will be published in program if entered in sufficient time.

Relay Race—Management will accept matches between any makes, providing three cars each are duly entered. Match to be agreed upon by both parties in which each car shall make one lap, stop, discharge passengers, who will transfer to second car, make a second lap, stop, passengers transfer to third car for last lap. Matches made and accepted will be entered in program.

Reverse Gear 75-Yard Dash—In two classes. Class 1: Touring cars to carry five passengers with sliding gear transmission, cover 75 yards from standing start in minimum time in reverse. Class 2: Open to all classes with planetary gear transmission carrying five passengers. This race to be run by time only. One trial. For classes A, B, C, and D only.

Obstacle Race—Two classes. Class 1: All cars over 100-inch wheelbase. Class 2: All cars under 100-inch wheelbase. Open to all cars. Barrels, flags, dummy pedestrians, and other obstacles will be placed on the track. Operator covering the prescribed course and touching the least number of obstructions. Prize will be given to car coming nearest to covering prescribed course within specified time.

Driving Test—Open to all cars of classes A, B, C, D, and E. To be standing start. Operator to start his crank motor, then remove his hat, coat, and vest, hanging them on separate pegs provided for the purpose, going 1-2 mile and returning to place of starting,

stopping his car, getting out of the car, putting on his hat, coat, and vest, get in his car, turning around obstacles and returning to the 1-2-mile mark, turning around and finishing at place of beginning.

Chauffeurs' Test for Putting On and Taking Off Tires—All tires must be blown up properly before the start. Cars will be required to go around the track once, keeping together, and upon coming to a stop in front of the grandstand the chauffeur will be told to remove one of the tires and to replace the inner tube. Chauffeurs will remove the tire, replace the inner tube, pump up the tire and travel once around the track, finishing at the grandstand. The journey around the track is simply to test the tire being pumped up properly. The prize goes to the man making the quickest change from the time word is given till the time he is told to make the journey around the track. Standard clincher tires only to be used, not more than six months old. No tire men allowed in competition. No cutting.

Second-Hand Car Race, Open to All Cars selling at less than one-third of the catalogue selling price. Distance, one mile. After this race all cars that participated to be auctioned off to highest bidder, entrant agreeing to sell at price of class in which he enters if higher bid cannot be obtained. Cars selling at less than \$500; at less than \$1,000; at less than \$1,200; at less than \$1,500; at less than \$2,500.

Complete Touring Car—Prize for the best-equipped touring car shown either on the track or in the spaces. Prize to go to the car which is best equipped for a thirty days' tour. Points awarded for horsepower, for size accommodations, accommodations in case of stormy weather, for touring, for complete tools in case of breakdown, for equipment of supplies in case of accident.

Certificates—A certificate will be awarded by the Trade Association to the manufacturer or local agent of the car winning any event, in addition to the regular prize which will be awarded to the contestant. Prizes shall be medals, cups, or other articles selected by the Association of the value of not less than \$20 each. Special cups may be offered for special events later. Entry fee of \$5 for each event, which must accompany the entry. Entries close May 15.

ENTRIES FOR EFFICIENCY CONTEST.

Following is a list of entries received up to Tuesday, May 1, by Secretary Butler, of the Automobile Club of America, for the A. C. A. Two-Gallon Efficiency Contest, to be run on Saturday, May 5. Some additional entries may be expected before the start of the event, as the entry list was not officially closed until Wednesday:

Make.	H.P.	Description.	Entered by.
Frayer-Miller	24	Touring car.	Frayer-Miller Car Co.
Locomobile	35	Touring car.	Albert B. Hilton.
Fiat	20	Touring car.	Hol-Tan Company.
Packard	24	Touring car.	A. R. Shattuck.
Darracq	35	Touring car.	Calvin T. Adams.
Packard	24	Touring car.	A. Ward Chamberlin.
S. & M. Simplex	30	Touring car.	Dave H. Morris.
Franklin	12	Light touring car.	R. G. Morris.
Frayer-Miller	36	Touring car.	F. E. Moskovics.
Frayer-Miller	24	Touring car.	Frayer-Miller Car Co.
Orient buckboard	4	Runabout.	E. P. Chalfant.
Orient buckboard	4	Runabout.	E. P. Chalfant.
Stoddard-Dayton	30	Touring car.	Dwight W. Pardee.
Napier	18	Runabout.	Napier Co. of America.
Franklin	12	Touring car.	Decauville Auto. Co.
Panhard	15	Touring car.	Dr. William M. Polk.
Renault	14	Touring car.	John B. Trevor.
Compound	16	Touring car.	E. H. V. Company.
Compound	16	Touring car.	E. H. V. Company.
Panhard	12	Touring car.	Am. Generator Co.
Leon Bollée	40	Touring car.	Cryder & Co.
Winton	20	Touring car.	J. Parke Channing.
Cadillac	10	Runabout.	Mrs. W. C. Martin.
Cadillac	10	Runabout.	Walter C. Martin.
Berlett (Am.)	24	Touring car.	H. K. Burras.
White	18	Touring car.	Carl H. Page.
Wayne	24	Touring car.	Wayne Automobile Co.
Aerocar	24	Touring car.	Percy Owen.

MANY ARRESTS FOR SPEEDING.

Arrests of automobilists by wholesale have been made in police traps in outlying parts of New York City and its suburbs on several Sundays this spring. Two such traps that have been most successful from the point of view of the constables and judges directly concerned were set in New Rochelle and on the Merrick Road, near Rockville Center, Long Island.

The New Rochelle trap, just beyond the northern limits of the city, had become an old story, and only one unwary traveler was caught, but the police of Yonkers got their usual Sunday quota, which this time included Albert R. Shattuck, ex-president of the Automobile Club of America, whose proud boast it has been that he always drove slowly and carefully in the city and never had had an accident. With five other victims, he deposited \$50 security for his appearance in court on Monday.

NEWS AND TRADE MISCELLANY.

Walter Christie, the star winner of the Atlantic City meet, had the driving wheels on the front of 110-horsepower Blue Streak equipped with Michelin flat tread racing tires.

The Queen of Italy has offered an international cup for the first aeronaut who crosses the Alps in a balloon. The Italian Aero Club is arranging preliminaries for the contest.

Roy Emerson, a rural mail carrier, of Alpena, Mich., has purchased an automobile in which to cover his route. The machine is the first to be used in that part of Michigan for such work.

The Jackson, Church & Wilcox Company is a new Saginaw, Mich., concern, formed for the purpose of manufacturing high-grade machinery and auto cars. The capital of the company is \$25,000.

C. Paul Tracy, a product of the automobile school of the Winton Motor Carriage Company, has been appointed office manager of the company's Pittsburg branch, under branch manager Earl H. Kiser.

The United States Manufacturers' Company, of Detroit, which makes gasoline engines, has merged its business into a stock company under the same style, having authorized capital stock of \$10,000, all of which has been subscribed and paid in in cash.

A corporation for the purpose of making and finishing castings has been formed at Detroit, under the name of the Detroit Motor Casting Company. The authorized capital stock of the new company is \$25,000, all of which has been subscribed and of which \$2,500 has been paid in in cash.

Work has begun on the mammoth addition to the Winton plant, at Cleveland, and will be pushed rapidly to completion. Having already covered practically all the ground of its property, the company is now compelled to extend its buildings upward, and the new work will mean the addition of a second story to the machine, painting, and varnishing buildings.

In the Automobile Club of America's two-gallon efficiency contest to be held Saturday of this week, there will be five Compound cars, three of which will be entered by owners and two by the manufacturers, the E. H. V. Company. The cars entered by the makers will be driven by D. F. Graham and Fred C. Carter, who represented the factory in the New York Motor Club's economy test held last November.

Two 16-horsepower Compound gasoline engines, arranged tandem, are being installed in a thirty-foot Otto racing boat of five feet beam, similar to one of 16 horsepower that awakened much interest on the Connecticut River last year. The new power plant is expected to drive the boat at twenty miles an hour. The E. H. V. Co., of Middletown, Conn., is installing the engines. There has been a considerable demand for Compound marine motors this spring, and several Connecticut boats have been fitted with Compound engines.

The promises of early deliveries made by the Aerocar people at last winter's shows are being realized, notwithstanding the immense amount of work required to get a brand new plant into smooth operation. Aerocars are now being delivered at the rate of from three to five a day. One day last week there

were fifty cars in the assembly room ready for the wheels, twenty cars in the hands of the testers, and ten in the finishing room, within two days of readiness for delivery.

The Pan American Crude Rubber Company, of Akron, Ohio, was incorporated at Columbus last week, with a nominal capital stock of \$1,000. The incorporators are George C. Allen, F. H. Watters, H. E. Address, F. E. Whittemore, and E. A. Oviatt, all prominent attorneys except Mr. Oviatt, who is superintendent of the Standard Table Oil Cloth Company's plant. The incorporators are not prepared to make any statement as to their plans, but it is understood that the intention is to handle crude rubber from the south on a large scale.

The Northern Manufacturing Company has closed an agency contract with John Tragardh, at Gotenborg, Sweden, who will handle its full line of cars during the present season. The initial order placed was for a carload of Northern models. The Northern Company also reports having opened an agency in Winnipeg, Manitoba. This will be known as the Northern Auto Company, and will be located at 336 Smith street. Others who will handle the Northern line for 1906 are A. J. Scott, Emerado, N. D., Charles Sidow, of Aberdeen, S. D., and the Curtin-Hebert Manufacturing Company, of Gloversville, N. Y.

It is asserted by the Electric Vehicle Company, makers of Columbias, that chief among the reasons for the rapidly growing popularity of the electric carriage is its desirability as a substitute for the horse-drawn vehicle in many lines of usefulness. For many purposes, especially in cities and their suburbs, which in the past have been supplied by the horse-drawn carriage, the electric possesses many advantages. It is excellent for runabout service, for physicians' use, for calling, shopping and other demands upon the private carriage, and is very practical for a great many pleasure drivers who are not mechanically minded.

Visitors to the factory of the Electric Vehicle Company, at Hartford, Conn., after inspecting the plant, and getting an idea of the various processes that enter into the making of gasoline and electric automobiles, are often favored with a drive about the city in one of the company's demonstration cars. The factory lies adjacent to one of the most beautiful sections of the city, and the route frequently followed leads through Forest street, one of the most beautiful thoroughfares in the country, where may be seen the former homes and grounds of such literary celebrities as Harriet Beecher Stowe, Charles Dudley Warner, Mark Twain and William Gillette, the playwright and actor.

The Carter International Motor Car Manufacturing Company, of Detroit, of which H. Carter is president and general manager, has no connection with the Motor Car Company, which manufactures the friction-drive cars. The Carter Duplex cars now under construction by the Carter International Motor Car Manufacturing Company, located at 98-100 Iron street, Detroit, the first lot of which will be ready for export in three to four weeks, are constructed after inventions by H. Carter, who transferred his patents for the Carter Duplex cars to the Carter Motor Car Corporation, of

Washington, D. C., and Milwaukee, Wis., which has the exclusive rights in the United States. Three-speed sliding gear transmission is used in the Carter Duplex cars.

The Maxwell-Briscoe Motor Car Company has received a number of inquiries from owners and users of Maxwell cars regarding the Glidden tour. C. W. Kelsey, eastern sales manager, says that there will be about twenty entries of Maxwell cars in the tour, and the company has decided to send two delivery wagons to carry spare parts and tires for the competitors who use Maxwells, as well as for conveying light baggage for the Maxwell entrants. Complete lines of extra parts will be carried and the delivery wagons will act as emergency cars to get to the places where any of the entrants may have met with minor accidents or suffered in any way. It is likely that a surgeon will accompany one of the wagons, and the vehicle will be so arranged that it can be converted into an ambulance if necessary.

Details of the test made at the Massachusetts Institute of Technology of the standard Compound engine made by the E. H. V. Company, of Middletown, Conn., have just been made public. The test was made by Prof. Joseph C. Riley, of the Institute staff, on April 5. A floating dynamometer was used, and several tests were made to insure accuracy. The testing-plant of the E. H. V. Company is a very complete one, but for purposes of confirming the readings made at the factory and to see if the factory machines were properly calibrated, the technical test was made. The regulation 295-pound flywheel was used on the engine. At 1,285 revolutions per minute the engine developed 16.1 horsepower. This is materially better than the previous claims made by the company for the same engine. Constructor David F. Graham has never claimed more than 16 horsepower at 1,300 revolutions. The power developed was maintained for a considerable time. The test was made in the Engineering Building of the Institute, at Boston. The engine was selected haphazard from a group set aside in the factory to be placed in stock Compound cars.

No matter what the route finally selected for the Glidden tour this year, it is understood that possibly half a dozen Thomas cars will take part in it. The season is early as yet for entries to be announced, but several enthusiastic owners of "Flyers" here declared their intention of taking part in the trip. Among these are C. A. Coey, of Chicago; C. S. Henshaw, of Boston, and A. V. Hart, of Rochester, N. Y. All of these gentlemen will drive their own cars. Coey's car will probably cause the eyes of the natives to pop out. It is finished in pure white and is trimmed with blue. Coey's monogram is blue, with many grapevine twists in five-inch letters, and is placed on the tonneau proper instead of on the doors. On the dashboard is a shining brass searchlight, an odometer, speedometer, gnomometer, and a clock. Several twists to the brass tubing of the French horn add still further to the dazzling effect. The final touch, however, comes in the presence of an eight-chime horn on the left-hand side of the car. To top it off, a keyboard has been arranged and each chime is connected to its proper key with a wire. Tunes that do not require more than a single octave can be played in a manner that places the circus caliope far in the rear.

INFORMATION FOR BUYERS.

The Continental Motor Mfg. Co. is now operating its new plant at Muskegon, Mich., but will also continue to operate its Chicago factory, at Lake and Peoria streets, that city, until fall. The Muskegon plant is equipped with a new and complete line of modern machinery and tools, in addition to that in operation at Chicago. An extensive addition is now being built to the Muskegon shops, which, when completed, will give the company one of the best equipped plants in the country for the manufacture of motors, transmissions, etc.

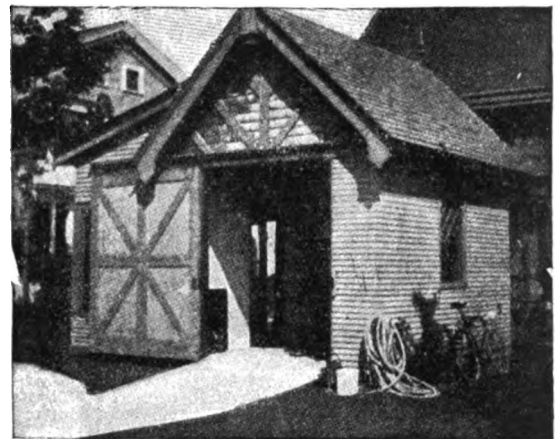
The most popular size of motor manufactured by the Continental people is the four-cylinder, vertical, 45-horsepower, shown in the accompanying illustration, and catalogued as Type "O." In this year's model the same symmetrical general design as shown in the 1905 production of lower power is adhered to, but some changes in detail, necessary to high-powered machines, are made. For instance, the cylinders are offset from the center of the crankshaft, lessening the angularity of the connecting-rod on the working stroke, effecting a more direct thrust on the crankpin and lessening the wear on pistons and rings. The pushrods are operated by levers which are pivoted on bearing shaft at back of case. These levers are drop forgings, fitted with hardened rollers, running against the cams, and are also hardened at the pushrod contact points. This arrangement is made so that the long levers avoid the shock of cams striking directly against the pushrods with the attendant wear and noise. The pushrods are fitted with adjusting caps retained by locknuts.

The general specifications of the motor are those incidental to machines of high-grade construction. Cylinders are cast in pairs with water jackets and valve chambers, the metal of special grade, and they are tested under hydraulic pressure and ground to a mirror finish. Pistons are of extra length, ground, and fitted

with four eccentric expansion rings with lap-joints. Crankcase is of special grade nickel-aluminum alloy, the camshaft compartment being separate from the main case, but cast integrally with same. Crankshaft is drop forged, accurately turned and ground, and has long bearings. Connecting rod is drop-forged steel, bushed with white bronze metal, and fitted with four retaining bolts, lock-nutted and cotter-pinned. Camshaft is high carbon steel and lubricated by splash from case. Induction and exhaust valves are of special nickel alloy, and white bronze is used for all bearings, all of which are scraped and hand-fitted. Each motor is given a thorough test before shipment and required to develop its rated power.

PORTABLE GARAGE.—The question of temporary housing of an automobile at the summer home or seaside cottage is not difficult to solve in view of the convenience and practicability of the portable garage, such as the one herewith illustrated. It is made by Charles H. Manley, St. Johns, Mich., who has been engaged for some time in making portable houses for universities and other large institutions in various parts of the country. The houses are built in sections and are shipped "knocked down." Anyone who can use a screwdriver can put them together, two or three hours sufficing for the job. The best Southern pine is used in their construction, the siding being seasoned and carefully matched, so as to make the house weather and wind proof, only needing painting to give it a finished appearance when set conspicuously on a lawn. The price of this house is extremely moderate.

BALL BEARINGS.—An interesting application of the Hess-Bright type of two-point contact annular ball bearings, as manufactured by the Hess-Bright Mfg. Co., 245 North Broad street, Philadelphia, is made in the built-up crankshafts of the Noble Automobile Syndicate, of Coventry, England. These shafts are forged in sections, two to each throw, and are fitted together on the line of the axis by forming the meeting ends with castellations that fit tightly together within the annular cone of one of the bearing sets and are firmly held together longitudinally by screw bolts having a conical head and a nut of similar shape. The wrists, as well as the main bearings, are carried in the annular ball bearings. Yet another application of these bearings is made by the De Dion-Bouton people, who mount the armature of their ignition magneto on them, using one bearing at either end of the armature shaft.



THE MANLEY PORTABLE GARAGE.

PERSONAL TRADE BREVITIES.

John H. McCarthy, president of the Wayne Automobile Company, of New England, has returned to Boston from Ormond, Fla., where he has been recreating for the past two months.

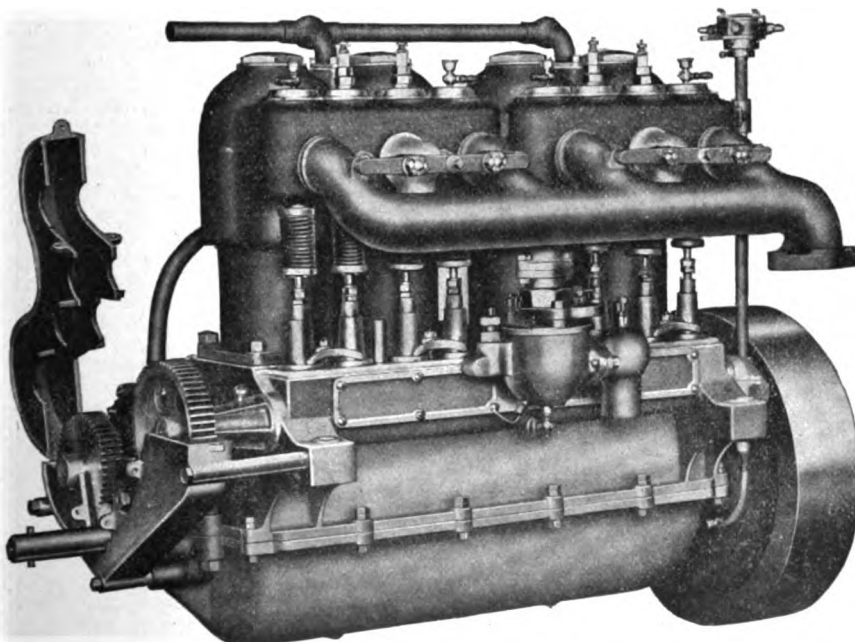
Ben. L. Jones, president of the Macon (Ga.) Automobile Club, has entered the trade as a partner of Shinholser & Co., at Jeffersonville, Ga., who handle the Franklin, Cadillac and Pope-Waverley in that territory.

Le Roy Pelletier has assumed charge of the advertising work of the Ford Motor Company, of Detroit, Mich. Mr. Pelletier is well known in trade journalistic circles and was lately connected with a Chicago publication.

Georges Griller, formerly of the Renault Company, has returned to Chicago from a business trip to Paris, where he closed a contract with the Renault people to equip their cars with a new shock absorber which he has invented.

Vice-President E. R. Hollander, of the Hol-Tan Company, of New York, is returning from Europe, where he completed arrangements for a Fiat team to compete in the Vanderbilt Cup race on the Italian team. Three members of the team who have been seen in America will be Lancia, Cedrino, and Nazzaro. It is expected that Mr. Hollander may bring over with him the auto-boat *Fiat XIII.*, which won the Prince of Monaco Cup in the recent Monaco meeting.

George P. Moore, of San Francisco, Pacific Coast representative of the Goodyear Tire & Rubber Company, spent last week at the factory, at Akron, Ohio. He pre-



CONTINENTAL TYPE O 45-H.P. MOTOR, WITH INLET AND EXHAUST VALVES ON SAME SIDE.

dicts that the sale of commercial vehicles and their accessories will be increased tenfold on account of the earthquake. The calamity to the city will act only as a temporary check to the automobile and tire trade there.

TRADE NOTES.

The Neumastic Tire Company, of St. Louis, has decided on the location of its New York plant, which is to be at 370 Manhattan avenue.

The Reliance Motor Car Company, of Detroit, Mich., has established a branch agency at 141 Massachusetts avenue, with J. R. Bradford in charge.

Clement-Bayard cars will be represented in New England in the future by the French Carriage Company, at the corner of Summer and Devonshire streets, Boston.

The Buffalo Automobile Station Company, 240 West Utica street, that city, has been made exclusive selling agent for the National line of cars for western New York.

The Hartford Suspension Company has moved to its new building at Broadway and Eighty-eighth street, New York City, where there has been fitted up a special salesroom for the sale of Gobron-Brillie cars, besides a place where Hartford suspensions can be applied while one waits. Some of the latest

of the Gobron-Brillie cars are expected from Europe in another week for immediate delivery. J. Pierpont Morgan is one of the recent buyers of Gobron-Brillie cars, he having purchased two of them.

C. S. Mendenhall, the map publisher of Cincinnati, Ohio, has just issued a new map of Maryland and Delaware. This edition shows an improvement over the previous work, and is useful to autoists as showing the general layout of the territory covered.

The Michelin Products Selling Company, Inc., of 31-33 West Thirty-first street, New York City, has established a subsidiary company to repair all makes of tires under Michelin methods, under the name of the Michelin Tire Repair Works, J. A. Straus, manager, at 242-244 West Forty-first street.

The National Sales Corporation, of New York, heretofore located at 256 Broadway, has removed to more commodious quarters at 296 Broadway, in order to accommodate its growing business. This company reports unusual activity in the various appliances handled by it as factory selling agent.

At the Rainier Company's New York show rooms, on Broadway, the business of taking new orders and delivering cars ordered goes merrily on. During the week 35-horsepower Rainier cars were purchased

by Alfred T. White, one of the first officials appointed by Mayor McClellan for the San Francisco relief fund; T. B. Ackerson, president of the New York Land & Warehouse Company; Gilbert Elliot, E. A. Strout, A. A. Carpenter, Jr., and John Clark Udell; the latter is buying his second car.

The East Liberty Automobile Company, of Pittsburg, has appointed sub-agencies for distributing Jackson touring cars in five counties of western Pennsylvania. The company is having an active demand for second-hand cars, especially of the late models, and will make this a feature of its business.

The Times Square Automobile Company has moved from 164 West Forty-sixth street, New York, to 215-217 West Forty-eighth street, the premises formerly occupied by the Vicquet Automobile Company. The new location will give the company four floors, 59x110 feet, with every facility for the rapid handling of cars.

Russell Drisko has taken the management of the Bay State Auto Company, of Boston, Mass. The concern is located at 1008 Boylston street, and it has a completely appointed mechanical garage on Norway street. Mr. Drisko is well known to the trade, having for many years been associated with Frederick E. Randall, agent for the Stevens-Duryea automobiles at 245 Columbus avenue.

INDEX TO ADVERTISERS

Acetylene Gas Illuminating Co.	45
Acme Motor Car Co.	102
Add-Wear Tire Sleeve Co.	48
Aerocar Co.	102
Am. Anti-Puncture Tire and Auto Co.	50
American Coil Co.	44
American Generator Co.	54
American Motor Truck Co.	86
American Veneer Co.	52
Anderson Forge & Machine Co.	46
Anderson & Price.	56
Archer & Co.	45
Artizan Brass Co.	78
Ashton Valve Co.	48
Aster Co., L.	69
Atwood Mfg. Co.	46
Auburn Automobile Co.	97
Auto Pump Co.	46
Auto Safety Starting Crank Works.	44
Auto Top & Equipment Co.	47
Automobile Equipment Co.	48
Automobile Supply Co.	49

Badger Brass Mfg. Co.	49
Baker Motor Vehicle Co.	102
Baldwin Chain Mfg. Co.	45
Beaman & Smith Co.	59
Beaver Mfg. Co.	70
Bemus, T. Alton.	61
Berkshire Automobile Co.	106
Beverly Mfg. Co.	46
Bicycle Step Ladder Co.	70
Blasler Mfg. Co., M. E.	17
Boker & Co., H.	45
Borbeln & Co., H. F.	53
Boston Mechanical Co.	57
Bowser & Co., S. F.	95
Boyle & Co., John.	79
Brennan Mfg. Co.	53
Bridgeport Vehicle Co.	Cover
Briscoe Mfg. Co.	46
Brown, R. E.	62
Brown, W. H.	80
Brown & Co., S. N.	47
Brownell-Trebert Co.	53
Buckeye Jack Mfg. Co.	99
Bullard Automatic Wrench Co.	Cover
Bullard, J. H.	54
Buob & Scheu.	47
Byrne-Kingston Co.	82

C. B. & Q. Ry. Co.	55
Cadillac Motor Car Co.	109
Capitol Foundry Co.	46
Central Garage.	50
Chalfonte Hotel.	69
Champion Co., A.	45
Champion Mfg. Co.	48
Chase & Co., L. C.	61
Chelsea Clock Co.	44
Chicago, M. & St. P. Ry.	57
Clark, E. P.	75
Cleveland Motor Car Co.	103

Coates Clipper Mfg. Co.	66
Collins & Sons, G. A.	47
Columbia Lubricants Co.	63
Columbia Steel Co.	74
Connecticut Tel. & Electric Co.	44
Continental Caoutchouc Co.	87
Continental Motor Mfg. Co.	53
Coops Co., C. W.	47
Corbin Motor Vehicle Corporation.	106
Covett Mfg. Co.	48
Crawford Automobile Co.	98
Cullman Wheel Co.	46
Cushing, J. M.	62
Dayton Electrical Mfg. Co.	48
Deere-Clark Motor Co.	97
Diamond Chain & Mfg. Co.	85
Diamond Rubber Co.	90
Dietz, R. E.	75
Diezemann Shock Absorber.	71
Dixon Crucible Co., Joseph.	56
Dominick Co., Wm.	62
Dorris Motor Car Co.	97
Dover Stamping & Mfg. Co.	44
Dow Portable Electric Co.	50
Duff Mfg. Co.	76
Duplex Coil Co.	71
Duplex Ignition Co.	51
Duquesne Construction Co.	45

E. H. V. Co., The.	100
Eastern Carbon Works.	62
Eclipse Buggy Co.	47
Edmunds & Jones Mfg. Co.	46
Eldredge Electric Mfg. Co.	44
Electric Rubber Mfg. Co.	50
Electric Vehicle Co.	98
Electrical Mfg. Co.	47
Elmore Mfg. Co.	105
English Daimler Co.	54
English & Mersick Co.	45
Erie Railway.	69
Excelsior Supply Co.	44

Fairmount Engineering Works.	49
Fiberloid Co.	72
Fitchburg Machine Works.	59
Ford Motor Co.	57
Forest City Motor Car Co.	98
Fox Reversible Engine Co.	63
Franklin Mfg. Co., H. H.	Cover
Franklin Portable Crane & Hoist Co.	54

G & J Tire Co.	91 and Cover
Gabriel Horn & Mfg. Co.	73
Garage Equipment Co.	48
Garford Co., The.	57
Gearless Transmission Co.	93
Geometric Tool Co.	59
Gilbert Mfg. Co.	48
Glover, George E.	48
Goodrich Co., B. F.	88
Goodyear Tire & Rubber Co.	87
Graham Cycle Co., E.	53
Gramlich Chemical Co.	47
Grand Hotel.	68
Gray-Hawley Mfg. Co.	45
Grout Bros. Automobile Co.	Cover

Haddon Hall.	69
Ham Mfg. Co.	76

Harburg Tire Co.	66
Hardy Co., The R. E.	45
Harris Oil Co., A. W.	69
Harrison Wagon Co.	108
Hartford Rubber Works Co.	58
Hartford Suspension Co.	53
Hassler Co., O. C.	44
Hatcher Auto Parts Co.	62
Havemeyer Oil Co.	44
Hawkins Mfg. Co.	50
Haynes Automobile Co.	107
Healy Leather Tire Co.	87
Helnze Electric Co.	75
Henry & Wright Mfg. Co.	60
Hicks Speed Indicator Co.	79
Hine-Watt Mfg. Co.	62
Hoffecker Speed and Mile Register Co.	66
Hoffman, George W.	45
Holley Bros. Co.	85
Hopewell Bros. Co.	66
Hopson & Chapin Mfg. Co., The.	46
Hotchkiss, P. M.	83
Hvatt Roller Bearing.	57
Hydraulic Oil Storage & Distributing Co.	46
Illinois Central Railroad.	68
Imperial Brass Mfg. Co.	51
Indianapolis Auto Ton Co.	47
Iroquois Motor Car Co.	50

Jacobs Mfg. Co.	53
Jamesville Wheel Co.	49
Janney, Steinmetz & Co.	46
Jeffery & Co., Thomas B.	110
Jersey Brake Co.	61
Johnson Sporting Goods Co., Iver.	44
Jones Speedometer.	80
Kallisch Air Brake Co.	55
Kent Mfg. Works, Atwater.	44
King Mfg. & Garage Co.	47
Kirkman Motor Mfg. Co.	54
Knox Automobile Co.	104
Knox Motor Truck Co.	94

Landis Tool Co.	58
Leather Tire Goods Co.	92
Leavitt, Gilbert.	44
Lipman, C. E.	44
Lobe Pump Co.	46
Locke & Co.	74
Locomobile Co. of America, The.	95
Logan Construction Co.	101
London Auto Supply Co.	47
Loomis Auto Car Co.	34
Loring, E. J.	48
Lozier Motor Co.	57
Lyon Utility Co.	50

M. & M. Mfg. Co.	49
Manlove Gate Co.	51
Manhattan Lamp Works.	77
Manhattan Storage Co.	49
Manning Mfg. Co.	45
Matheson Motor Car Co.	99
Maxwell-Briscoe Motor Co.	108
McCord Mfg. Co.	50
McDonald, Wessels & Ames Co.	46
Merritt Co.	47
Miami Pattern Works.	46
Michelin Products Selling Co.	89
Michigan Top Co.	47

THE AUTOMOBILE

VOL. XIV.

NEW YORK—THURSDAY, MAY 10, 1906—CHICAGO

No. 19

TWO-GALLON MILEAGES THAT PROVE MUCH

By H. F. DONALDSON.

American air-cooled cars carried off the principal honors in the two-gallon efficiency contest of the Automobile Club of America last Saturday. A Franklin runabout with two passengers traveled all the way from the starting point at Fifty-sixth street and Avenue A, New York, to New Haven on the official allowance of two gallons of gasoline, and won first place out of a list of nearly seventy contestants. The gross weight of the car was 2,700 pounds, and this mass was transported just eighty-seven miles on an outlay of about forty cents for fuel. Under the for-

mulæ used by the contest committee, the official score for the car was 200,100. Second place was won by a Frayer-Miller five-passenger touring car, which scaled 4,070 pounds and covered forty-eight miles, its official score being 194,953 points. Third prize fell to a French water-cooled car, the 20-horsepower Darraq driven by S. B. Stevens, the well-known amateur racing man. He also carried five passengers, which brought the gross weight of the machine up to 3,910 pounds, and when his supply of fuel failed he was forty miles on the road to Boston. This fine performance



WAITING IN LINE TO GO ON THE SCALES PRIOR TO THE START OF THE CONTEST.



FORTY MILES OUT IN THE BERLIET.



CLUB SURVEYORS CHECKING MUSKOVIC'S FRAYER-MILLER.



THE BUICK FINISHES ON BAD HILL AT PORTCHESTER.



S. & M. SIMPLEX CROSS-COUNTRY CAR ON SHORE ROAD.



PERCY OWEN IN THE AEROCAR WAITING FOR RELIEF.



THE FRANKLIN CAR THAT WON THE CONTEST.

gave him a position on the official score of 181,580 points. An East Side brewery on First avenue between Fifty-sixth and Fifty-seventh streets was selected for the starting point, as the streets in the neighborhood are wide and vehicular traffic rather light for New York. Then, too, a big platform scale stands outside the brewery with a gentle slope from the north over which competing cars were rolled by hand to be weighed.

The course led from the official starting point at Avenue A and Fifty-sixth street to Fifth avenue, on which the cars turned north, passing the clubhouse in review and continuing in a general northeasterly direction along St. Nicholas avenue, and One Hundred and Fifty-fifth street to Central Bridge. Here the city proper might be said to have been left behind, and the next few miles led through the suburban districts bordering Jerome avenue, Fordham road and Pelham Parkway to the Shore Road—the familiar route to the Hub.

How the Start of the Contest Was Made.

For hours before the start, at 12:30 o'clock in the afternoon, the quiet of the East Side streets in the vicinity of the brewery was disturbed by the honking of horns and the musketry of exhausts as car after car dashed up to the curb. Beside the three score and six of starters there were many automobiles of spectators, press cars, and tenders carrying committeemen and supplies. About noon the scene at the start was really an open-air auto show. Never before at a contest were so many different types of cars grouped together. There were touring cars, domestic and foreign, with every style of body, cross country and full side entrance, with tops and canopies of as many different shapes and colors, closed cars and runabouts down to the diminutive Orient buckboard—which later made a splendid run—and even a tri-car which had been entered for a certificate of performance. And, towering high above all other contestants, the big Mack observation car held a roomful of passengers. And in the personnel there was about as much contrast as between the machines. Ladies occupied many seats in contestants' cars, and children were plentiful, even to babies in arms. At the other extreme were drivers of some of the imported machines; bearded Frenchmen, clothed for long distance travel, lending a serious sporting air



MAC K OBSERVATION WAGON WAITING FOR START



S. B. STEVENS AND DARRACQ THAT WON THIRD PLACE.

that suggested the road race rather than the legal-speed contest. Gasoline was never so free as at the start. Every car in the contest was required to empty its fuel tank to the satisfaction of the club inspector, who then saw that the two gallons were emptied from the official cans into the tank. Thrifty youngsters of the neighborhood brought pails to catch the supply that each car poured out, and in the interval between the official filling-up and the weighing-in, some of these youths offered the surplus fuel for sale to the contestants. As there was no official supervision of the cars in the interval only the drivers' consciences prevented a trade.

As each car was rolled on to the scales an observer was picked from a group of college students and others of a nondescript type who stood about, and the car was weighed in with the observer on board. A gang of able-bodied men then rolled the car further down the street toward the corner from which the course was measured; the driver cranked his motor and the car disappeared in the canyon of a city street.

Up to the time the first few cars were sent away the morning was brilliantly fine, hot enough to make wraps a nuisance, but early in the afternoon the sky clouded up and signs of a storm made the committee anxious. By 2:30 o'clock the last car had been sent away, the neighborhood sightseers dispersed and the brewery hands resumed the making of beer.

Meanwhile the procession of cars, each with its banner bearing the club flag and the contest number tied to the body, had strung out far into the outlying suburbs of New York. Early in the contest an unexpected obstacle was met which certainly decreased the recorded mileage of some of the cars. The annual speedway parade of horse drivers had the right of way on many of the streets in the upper end of the city, and when a number of the competing machines reached One Hundred and Fifty-fifth street they could not follow the official route, but had to turn back and take another course to Central Bridge.

About the middle of the afternoon the signs of a storm gave place to the reality, and for the rest of the day rain fell in tropical showers. The streets ran rivers along each curb, and on the dirt roads the sticky mud made driving slow and dangerous. Slipping, skidding and splashing through pools, the cars pushed on, the passengers in the open machines soaked to the skin. Little dry goods stores in the towns did a splendid trade in cheap um-



ORIENT BUCKBOARD ON THE SCALES.



MAXWELL-BRISCOE TOURING CAR IN STAMFORD, CONN.



RENAULT LANDAULET IN GREENWICH, CONN.



RELIEF CAR WHITE STEAMER ALONGSIDE THE MARTINI.



A. R. SHATTUCK IN HIS PACKARD WAITING FOR RELIEF.



ONLY TWO-CYCLE CAR IN CONTEST—ELMORE.

brellas, for no one thought of quitting. There were dry stretches of fine macadam road in some of the beautifully kept towns in the route, and on these the temptation to do some fast high gear driving was irresistible. A few police reprimands were noticed. There was little or no racing between cars, however, for each contestant knew that speed at the expense of distance traveled was not worth while.

First to succumb was an imported machine, a Mors touring car carrying five passengers, which "went dead" by the roadside in the picturesque town of Bartow, not far from the New York Athletic Club grounds. The Mack observation wagon surprised the knowing ones by covering a fraction more than seventeen miles, and incidentally capturing fifth place in the scale of awards under the formulæ of the committee. The transportation of nineteen pas-

MECHANICAL DATA OF CARS ENTERED IN AUTOMOBILE CLUB OF AMERICA TWO-GALLON EFFICIENCY CONTEST, NEW YORK, SATURDAY, MAY 5, 1906.

OFFICIAL NUMBER.	ENTERED BY	Make.	H.P.	Type of Car.	Number of Cylinders.	Bore and Stroke	Cooling.	Ignition.	Compression. lbs.	Speeds	Drive.	Tires.
1	Frayer-Miller Motor Car Co.	Frayer-Miller	24	tourist	4	4 1-16 x 5 1/2	air	h. t. coil	70	4	shaft	Continental
2	Albert B. Hilton	Locomobile	30-35	tourist	4	4 1/2 x 5 1/2	water	m. & b. mag.	80	3	chain	Diamond
3	The Hol-Tan Co.	F. I. A. T.	20	tourist	4	105 x 130 mm.	water	m. & b. mag.	65	4	chain	Michelin
4	A. R. Shattuck	Packard	24	tourist	4	4 1/2 x 5 1/2	water	h. t. mag.	75	3	shaft	Fisk
5	Calvin T. Adams	Darracq	30-35	tourist	4	120 x 130 mm.	water	m. & b. & j. s.	...	3	shaft	Michelin
6	A. Ward Chamberlain	Packard	24	tourist	4	4 1/2 x 5 1/2	water	h. t. mag.	74	3	shaft	Diam. & Mich.
7	Dave H. Morris	S. & M. Simplex	30	tourist	4	4 1/2 x 5 1/2	water	jump spark	74	4	chain	Michelin
8	R. G. Morris	Franklin	12	light t'rist	4	3 1/2 x 3 1/2	air	jump spark	50	2 (plan)	1 chain	Goodrich
9	F. E. Moskovics	Frayer-Miller	36	tourist	6	4 1-16 x 5 1/2	air	h. t. coil	72	4	shaft	Continental
10	Frayer-Miller Motor Car Co.	Frayer-Miller	24	tourist	4	4 1-16 x 5 1/2	air	h. t. coil	72	4	shaft	Continental
11	E. P. Chalfant	Orient	4	buckboard	1	3 1/2 x 4 1/2	air	h. t. coil	64 (disc drive)	...	...	International
12	E. P. Chalfant	Orient	4	buckboard	1	3 1/2 x 4 1/2	air	h. t. coil	64 (disc drive)	...	...	International
13	D. W. Pardee	Stoddard-Dayton	30	tourist	4	4 1/2 x 5	water	h. t. coil	60	3	shaft	Firestone
14	Napier Motor Co. of America	Napier	18	runabout	4	3 1/2 x 4	water	h. t. coil	70	3	shaft	Michelin
15	Decauville Auto Co.	Franklin	12	tourist	4	3 1/2 x 3 1/2	air	h. t. coil	60	3	shaft	Diamond
16	Dr. Wm. M. Polk	Panhard	15	tourist	4	3 1/2 x 4	water	h. t. coil	...	4	chain	Michelin
17	John B. Trevor	Renault	14	brougham	4	...	water	h. t. mag.	...	3	shaft	Mich. & Sams'a
18	E. H. V. Co.	Compound	16	light tourist	3	4 x 4	water	h. t. coil	90	3	shaft	Pennsylvania
19	E. H. V. Co.	Compound	16	light tourist	3	4 x 4	water	h. t. coil	90	3	chain	Pennsylvania
20	American Generator Co.	Panhard	12	tourist	4	90 x 130 mm.	water	h. t. coil	70	4	chain	Michelin
21	Cryder & Co.	Leon-Bolle	40	tourist	4	130 x 150 mm.	water	bat. & mag.	80	4	chain	Michelin
22	J. Parke Channing	Winton	16-20	tourist	4	3 1/2 x 5	water	m. & b. mag. (?)	60	2	shaft	Goodrich
23	L. R. Burne	Cadillac	10	runabout	1	5 x 5	water	h. t. coil	60 (plan)	2	1 chain	Dunlop
24	Walter C. Martin	Cadillac	10	runabout	1	5 x 5	water	h. t. coil	60 (plan)	2	1 chain	Dunlop
25	H. K. Burras	Berliet	24	tourist	4	100 x 120 mm.	water	l. t. mag.	...	...	chain	...
26	Carl H. Page	White Steamer	18	tourist	2 comp'd	2 1/2 x 5 x 3 1/2	cond'ser	...	...	2	shaft	Diamond
27	Percy Owen	Aerocar	24	tourist	4	4 x 4	air	h. t. coil	70	3	shaft	Continental
28	Charles M. Jacobs	Rochet-Schneider	24-35	tourist	4	120 x 140	water	l. t. mag.	75	4	chain	Michelin
29	Wm. H. Barnard	La Comete	25-30	tourist	4	...	...	...	...	...	...	...
30	C. D. Alton, Jr.	Columbia	24-28	tourist	4	4 x 4 1/2	water	l. t. mag.	85	3	shaft	...
31	F. Ed. Spooner	Franklin	12	tourist	4	3 1/2 x 3 1/2	air	h. t. coil	60 (plan)	2	1 chain	Goodrich
32	Chas. D. Van Schaick	Covert	6 1/2	runabout	1	4 x 4 1/2	water	h. t. coil	60	2	shaft	...
33	W. J. P. Moore	Moore	40	runabout	4	4 1/2 x 5 1/2	water	d'ble h. t. mag.	85	4	shaft	Continental
34	Dr. Edwin Steese	Elmore	35	tourist	4	4 1/2 x 4	water	h. t. coil	60	3	shaft	Fisk
35	Hugh J. Grant	Renault	14	brougham	4	90 x 120 mm.	water	h. t. coil	...	...	shaft	Michelin
36	John Kane Mills	Oldsmobile	7	tourist	1	5 x 6	water	h. t. coil	80 (plan)	2	1 chain	Diamond
37	Maxwell-Briscoe Motor Co.	Maxwell	10	runabout	2	4 x 4	water	h. t. coil	65 (plan)	2	shaft	International
38	Maxwell-Briscoe Motor Co.	Maxwell	16	tourist	2	5 x 5	water	h. t. coil	60	3	shaft	Ajax
39	Augustus Post	White Steamer	15	tourist	2 comp'd	2 1/2 x 5 x 3 1/2	cond'ser	...	...	2	shaft	Diamond
40	White Sewing Machine Co.	White Steamer	18-20	tourist	2 comp'd	2 1/2 x 5 x 3 1/2	cond'ser	...	...	2	shaft	Diamond
41	Welch Motor Car Co.	Welch	50	tourist	4	4 1/2 x 5	water	h. t. coil	80	2	shaft	Continental
42	A. F. Mack	Mack	40-50	18 pas. tour.	4	5 1/2 x 6	water	h. t. coil	70	4	chain	Hartford
43	Palmer & Christie	Martini	30-40	tourist	4	125 x 140 mm.	water	l. t. mag.	...	4	chain	Continental
44	Irving Brokaw	Mercedes	40	runabout	4	120 x 150 mm.	water	l. t. mag.	...	4	chain	Michelin
45	F. M. Dampman	Indian	1 1/2	tri-car	1	2 19-32 x 3	air	h. t. coil	...	...	chain	G & J
46	Frank C. Armstrong	Bliss	40	tourist	4	4 1/2 x 6	water	h. t. coil	65	4	chain	Michelin
47	William Ives	Peerless	30	tourist	4	4 1/2 x 5	water	h. t. coil	...	...	shaft	Diamond
48	Miss Clara Wagner	Franklin	12	tourist	4	3 1/2 x 3 1/2	air	h. t. coil	60	3	shaft	Goodrich
49	Decauville Auto. Co.	Franklin	30	tourist	6	4 x 4	air	h. t. coil	60	3	shaft	Diamond
50	R. G. Howell	Franklin	20	tourist	4	4 x 4	air	h. t. coil	60	3	shaft	Diamond
51	Decauville Auto. Co.	Franklin	12	runabout	4	3 1/2 x 3 1/2	air	h. t. coil	60 (plan)	2	1 chain	Diam. & G'rich
52	J. B. F. Herreshoff	Packard	24	tourist	4	4 1/2 x 5 1/2	water	h. t. coil	...	3	shaft	Diamond
53	John Henry Hammond	Northern	18	tourist	2	...	...	...	...	...	...	...
54	Majestic Auto. Co.	Queen	26-28	tourist	4	4 1/2 x 4 1/2	water	h. t. coil	65	3	shaft	Goodyear
55	C. E. Knoblauch	Columbia	40-45	tourist	4	5 x 5	water	h. t. coil	85	4	chain	Continental
56	Wayne Auto. Co.	Wayne	24	tourist	4	4 x 5	water	h. t. coil	62	3	shaft	Fisk
57	Col. John Jacob Astor	Mors	40-52	tourist	4	5 x 6	water	m. & b. mag.	90	4	chain	Michelin
58	J. Horace Harding	Renault	10	landaulet	4	3 x 4 23-32	water	h. t. mag.	...	3	shaft	Michelin
59	Archer & Co.	Hotchkiss	35	tourist	4	4 1/2 x 4 1/2	water	magneto	80	4	shaft	Michelin
60	C. M. Bouggy	Amer. Mercedes	45	tourist	4	4 23-32 x 5 29-32	water	m. & b. mag.	65	4	chain	Continental
61	Duryea Power Co.	Duryea	12-15	runabout	3	4 1/2 x 4 1/2	water	m. & b. mag.	50	2	1 chain	Hart. Dunlop
62	Arnold & Stearns	Compound	16	tourist	3	4 x 7 x 4	water	h. t. coil	90	3	shaft	Diamond
63	H. A. Lozier, Jr.	Lozier	40	tourist	4	4 1/2 x 5 1/2	water	h. t. mag & bat.	70	4	chain	Diamond
64	Lozier Motor Co.	Lozier	40	tourist	4	4 1/2 x 5 1/2	water	h. t. mag & bat.	70	4	chain	Diamond
65	Emerson Brooks	Reo	16	tourist	2	...	water	h. t. coil	...	...	...	Fisk
66	Leslie B. Farmer	Oldsmobile	4	runabout	1	4 1/2 x 6	water	h. t. coil	...	(plan) 2	1 chain	Fisk
67	Andrew Freedman	Rochet-Schneider	40-50	tourist	4	140 x 140 mm.	water	m. & b. mag.	75	4	chain	Michelin
68	Darracq Motor Car Co.	Darracq	20-32	tourist	4	112 x 120 mm.	water	h. t. c'l' & l. t. m'g.	...	3	shaft	Michelin
69	H. J. Koehler	Buick	22	runabout	2	4 1/2 x 5	water	h. t. coil	95 (plan)	2	1 chain	Diamond
70	J. S. Bunting	S. & M. Simplex	30	runabout	4	4 1/2 x 5 1/2	water	h. t. coil	58	4	chain	Continental
71	S. B. Stevens	Darracq	15-20	tourist	4	90 x 120 mm.	water	l. t. & h. t.	...	3	shaft	Michelin



LOZIER DEAD ON LEFT. FRANKLIN RUNNING IN CENTER. "THE AUTOMOBILE" CAR ON RIGHT.

sengers from New York to New Rochelle on 40 cents worth of fuel was a demonstration worth while, even if it was not spectacular. About two miles further up the road a pair of big touring cars, domestic and foreign, kept one another company. Still further along the steamers were laid out at intervals of a few miles, these machines making very consistent performances, one White with five passengers covering nearly twenty-six miles, distancing many of its gasoline rivals. From Mamaroneck (22 miles) on the cars were more frequently seen stalled, some by the roadside and a few in the towns of Rye, Portchester, Greenwich, and Stanford.

If the rain dampened hopes and cut down mileage records made in practice, it also beautifully laid the dust and sprinkled the lawns. The trees and shrubs in the well-kept grounds of country houses took on new color, and the freshness of spring gave a charm to the scene at every turn in the road. Where this skirted the shore pretty views of Long Island Sound and white-canvased craft alternated with the wooded slopes and levels of private grounds, and every few hundred yards a colonial mansion or picturesque cottage gave shelter to little groups of suburban spectators.

In the towns the audiences were larger. The village oracle always had a group of listeners who couldn't quite understand



IN FRONT, LOCO WITH RIKER. IN MIDDLE, RELIEF WHITE STEAMER. IN REAR, PRESS CAR DRIVEN BY ANGUS SINCLAIR.



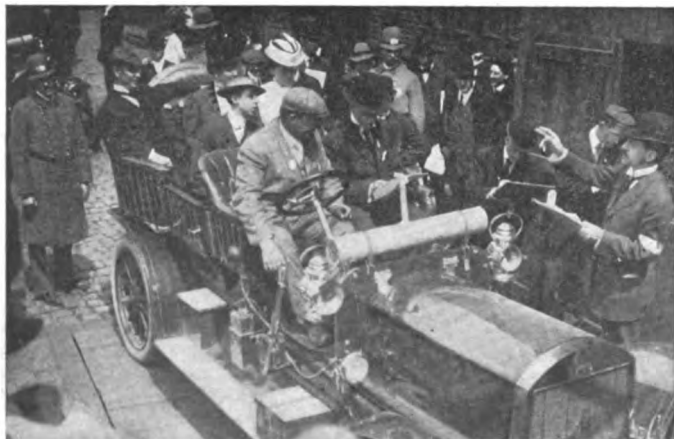
FILLING SPECIAL CONTEST TANK FROM TWO-GALLON-CAN.

why a car should stop without the bonnet being raised or a tire detached. The mystery was not even cleared up when the relief car arrived with the official surveyors on board. The course had previously been surveyed and mile landmarks painted on houses and fences by the roadside, so that with a tape line the exact location of any car could be easily determined and the total distance traveled recorded. An inspection of the competing car was made at the same time, and especially of the relief cans of gasoline, which had been placed on board each machine at the weighing-in scale. When the inspection was completed the driver of the car in the contest was permitted to empty the relief can into his fuel tank and return to the city.

Many of the cars were equipped with special tanks, as appear in some of the accompanying photographs. These were usually attached to the dash and took the form of vertical cylinders with cone-shaped bottom connected to the special supply pipe to the carbureter. In all other respects the cars were equipped as stock machines.

There were three relief cars. One started working along the line from the city, another began work about twenty-five miles out, and the third was supposed to follow and overtake the leading car and work back toward New York. On account of the great distances covered by some of the cars in the contest the number of relief machines proved to be insufficient, and there were many long waits on the road, several hours in some cases, before the contestants were officially released.

Besides the high record of the winning car there were some remarkably long runs made. The little American tri-car covered almost 100 miles from the starting line, an Orient buckboard traveled 98.83 miles on the two-gallon allowance and the little Covert air-cooled runabout ran itself out of fuel after 73.75 miles had been left behind. The two-cycle Elmore went 28.12 miles, and one of the Compound cars 43.5 miles before the final stop.



MUSKOVIC'S FRAYER-MILLER ON SCALES WEIGHING IN.



EMPTYING FUEL TANK BEFORE TAKING ON TWO GALLONS.

Single cylinder cars also did remarkably well in actual distance run; an Oldsmobile scored 56.3 miles and a Cadillac 55.5 miles, the latter with four passengers up.

The official results in full and data of the competing cars will be found in the accompanying tables. There may be some changes in the final awards, as many protests were filed. This, together with the large entry list and the unexpectedly long distances covered by some of the cars, delayed the final awards much longer than the contest committee had anticipated; it had, in fact, announced that the awards would be made after a continuous sitting.

The committee consists of Schuyler Skaats Wheeler, chairman; George F. Chamberlin and Charles G. Curtis.

How Reports Came to Headquarters.

Contrary to general expectation, the clubrooms did not attract many members during the afternoon and evening. Outside of the officials and their assistants, and later on some of the returning drivers, it is doubtful if a half dozen members showed up.

At 2:20 o'clock, when word came over the 'phone of the stopping of No. 60 at Portchester, only the regular clerks of the club were there. A little later the officials arrived from the scales. Thereafter every few minutes the telephone bell would ring and word come in of the stopping of a car. Newspaper men and returning observers soon began to crowd the rooms, and at 6 o'clock the parlor of the club presented a most animated appearance. At one end of the room were clerks with a computing machine receiving reports which were displayed on a large score sheet that had been prepared. Among the returning contestants was Irving Brokaw, who told of the storm and of the arrest of some of the competitors for speeding. He was held up by two officers but subsequently allowed to proceed.



A STOP ON THE ROAD TO FIX A TIRE.

RESULTS OF TWO-GALLON EFFICIENCY CONTEST,
SHOWING ORDER OF WINNING, MILEAGE COVERED,
WEIGHTS, NUMBER OF PASSENGERS AND
POINTS WON.

Order of Winning	Name of Car	Official No.	Mileage Covered	Number of Pass.	Total Loaded Weight	Contest Weight	Points Figured by Formula
1	Franklin	51	87.0	2	1,500	2,300	200,100
2	Frayer-Miller	10	47.9	5	3,270	4,070	194,953
3	Darracq	71	46.44	5	3,110	3,910	181,580
4	Berliet	25	39.1	5	3,660	4,460	174,386
5	Mack	42	17.13	20	9,325	10,125	173,441
6	Franklin	15	58.4	4	2,140	2,940	171,696
7	Queen	54	41.4	4	3,160	3,960	163,944
8	Stoddard-Dayton	13	40.83	5	3,200	4,000	163,320
9	Loxler	64	30.28	6	4,490	5,290	160,181
10	Renault	17	36.61	3	3,400	4,200	153,767
11	Darracq	68	34.62	4	3,600	4,400	152,328
12	Compound	19	43.5	5	2,635	3,435	149,422
13	Frayer-Miller	1	35.5	5	3,400	4,200	149,100
14	Renault	58	36.83	4	3,240	4,040	148,793
15	Packard	6	30.25	6	4,110	4,910	148,527
16	Napier	14	49.1	2	2,220	3,020	148,282
17	Compound	18	43.4	5	2,610	3,410	147,994
18	Franklin	48	48.32	4	2,240	3,040	146,892
19	Am. Mercedes	60	27.77	7	4,440	5,240	145,566
20	Orient Buckboard	12	98.83	2	930	1,451	143,358
21	Frayer-Miller	9	29.40	7	4,055	4,855	142,737
22	Packard	52	30.56	5	3,860	4,660	142,409
23	Packard	4	32.51	4	3,580	4,380	142,393
24	Franklin	50	39.86	5	2,720	3,520	140,307
25	La Comete	29	26.0	6	4,540	5,340	138,840
26	Locomobile	2	25.41	7	4,640	5,440	138,280
27	Aerocar	27	33.79	5	3,250	4,050	136,849
28	Orient Buckboard	11	93.8	2	920	1,444	135,447
29	Duryea	61	53.5	4	2,030	2,525	135,114
30	S. & M. Simplex	7	28.64	5	3,900	4,700	134,608
31	Franklin	31	44.5	5½	2,220	3,020	134,390
32	Franklin	8	45.0	4	2,170	2,970	133,650
33	Cadillac	24	55.5	4	2,250	2,375	131,812
34	Martini	43	26.88	4	3,970	4,770	128,712
35	Franklin	49	31.84	5	3,230	4,030	128,315
36	Fiat	3	30.43	3	3,340	4,140	125,980
37	Compound	62	39.49	4	2,360	3,160	124,788
38	Columbia	55	24.3	5	4,220	5,020	121,986
39	Covert	32	73.75	2	1,220	1,654	121,982 ?
40	Rochet-Schneider	28	25.34	4	4,000	4,800	121,632
41	Renault	35	30.55	4	3,180	3,980	121,589
42	Mercedes	44	28.63	3	3,410	4,210	120,532
43	Elmore	34	28.2	5	3,380	4,180	117,876
44	Darracq	5	26.81	3	3,560	4,360	116,891
45	Indian Tri Car	45	99.8	2	500	1,150	114,770
46	Winton	22	28.5	5	3,080	3,880	110,580
47	Oldsmobile	36	56.3	2	1,660	1,962	110,460
48	Hotchkiss	59	23.1	5	3,900	4,700	108,570
49	White Steamer	40	25.96	5	3,380	4,180	108,512
50	Maxwell	38	36.01	5	2,640	2,780	100,107
51	Cadillac	23	48.6	2	1,780	2,046	99,435
52	Columbia	30	26.28	4	2,920	3,720	97,761
53	White Steamer	26	23.81	4	3,225	4,025	95,835
54	S. & M. Simplex	70	24.13	2	3,110	3,910	94,348
55	Bliss	46	19.01	5	4,140	4,940	93,909
56	White Steamer	39	22.51 ?	5	3,370	4,170	93,867
57	Wayne	56	22.0	5	3,000	3,800	83,600 ?
58	Mors	57	15.72	5	4,490	5,290	83,158
59	Oldsmobile	66	45.5	2	1,330	1,731	78,760
60	Panhard	20	19.53	4	3,190	3,990	77,924
61	Northern	53	25.87	3	2,760	2,870	74,246
62	Bulck	69	28.78	2	2,280	2,510	72,237

Those that did not start or failed to finish.—

No.	Car.	Remarks.
16	Panhard	Did not start.
20	Panhard	Withdrew with hot engine.
21	Leon Bollee	Did not start.
23	Moore	Did not start.
37	Maxwell	Did not wait for relief car; disqualified.
41	Welch	Did not start.
47	Peerless	Did not finish.
43	Loxler	Got off the course; disqualified.
45	Reo	Withdawn.
47	Rochet-Schneider	Did not start.

During the evening the formulæ on which the contest was based aroused some discussion, and somebody figured that the little Orient buckboard would have to reach the Maine woods to win a prize. Reports continued to come in but slowly, and one heard continued inquiries for cars from which no report had been received. In this case no news was considered good, the inquirers consoling themselves with the idea that the cars were still running. From the returning contestants all kinds of stories of hard luck were heard, one car stopping a few feet from the brow of a hill from which it could have coasted a mile. Another told of being held up in a traffic block; another of a leaking tank, and so on down the usual list of troubles. At midnight there was a big proportion of the starters not heard from, and a decision in the contest looked highly improbable for several days.

Winning Cars Repeat Record Performances.

To prevent any possibility of dispute of the performances of the two leading cars, the Contest Committee called upon the Franklin and Frayer-Miller entries to repeat the run under the original test conditions. The winners promptly accepted, and on Tuesday the run was repeated, with results exceeding the records made on Saturday. The Franklin runabout covered 95 miles, reaching a point about one mile beyond Wallingford, Conn. The Frayer-Miller, with its load of five passengers, stopped at 59.8 miles from the start. Both cars would probably have made better performances, but that the driver of the Frayer-Miller was delayed by arrest for speeding, and the Franklin got off the road.

WORCESTER TO HAVE ANOTHER CLUB.

WORCESTER, MASS., May 7.—A club to be devoted to automobilists exclusively is being formed, and plans are so far matured that Memorial Day has been set for the opening. The new club has been formed with a membership limit of 300, and this has already been reached. The entrance fee is \$50, and the yearly assessment is \$25. Recently the Worcester Automobile Club changed its policy so that it was not necessary to be an automobilist to become a member, and its membership owing to the new change reached 300.

The new club has purchased the famous Hermitage estate, located near the city on a hill that commands some excellent views. The cost price is said to be \$27,500. Located on it are the Hermitage and Vista lodges, the estate has its own heating and lighting plants, and taken all in all will fill the bill to a nicety. The club plans to provide a country home for its members, with facilities for lunching and remaining over night, and for the housing of cars. George W. Beals, of Boston, for the past fourteen years secretary of the Boston Athletic Association, is the temporary secretary, and Irving S. Brown, of this city, is temporary treasurer. The temporary organization is in the hands of a special committee.

JOSEPH H. WOOD NOW CLUB PRESIDENT.

NEWARK, N. J., May 7.—The annual meeting of the enterprising New Jersey Automobile and Motor Club was well attended. These are the new officers: President, Joseph H. Wood; vice-president, Angus Sinclair; secretary, H. A. Bonnell; treasurer, James C. Coleman. The trustees elected were Dr. James R. English, J. W. Mason, W. C. Shanley, and Paul E. Heller.

NEW QUARTERS FOR BAY STATE A. A.

BOSTON, May 7.—The Bay State Automobile Association has secured new clubrooms at 281 Dartmouth street. It is a four-story building and will be occupied by the club exclusively. An experienced chef will have charge of the café, which will be run for the benefit of club members. The rooms will be ready for occupancy June 1.

MAY MEETING OF THE N. A. A. M.

Thirteen members attended the May monthly meeting of the N. A. A. M. executive committee, held in New York City, May 3.

R. Harry Croninger, of the Dayton Motor Car Company; J. B. Bartholomew, of the Bartholomew Company; Benjamin Briscoe, of the Maxwell-Briscoe Motor Company; and R. E. Olds, of the Reo Motor Car Company, were admitted to membership.

The legislation committee reported that it had received advices from Albany that the L'Hommiedieu bill had been defeated in the committee on rules, thus disposing of all legislation and leaving the situation in the same condition as has prevailed for the last eighteen months.

The good roads committee reported that the association's contribution toward the maintenance of the good roads bureau at Washington, designed to further the interests of the Brownlow bill providing for national aid in the construction of good roads, had expired, and expressed the opinion that in view of the action of New York state, which is likely to be followed by other states, in providing ample funds for state aid, it would be almost impossible to secure assistance from the national government. The executive committee decided that it would be the part of wisdom to discontinue the operation of the bureau in Washington.

A committee composed of President O. A. Quayle, F. H. Elliott, H. A. Meldrum, F. H. Mason, and H. S. Woodworth, representing the New York State Automobile Association, laid before the committee certain plans designed to further the interests of automobilists and automobile legislation. The subject was referred to the legislative committee, which will report at a subsequent meeting.

What Information the Bisons Took Home.

BUFFALO, May 5.—President H. A. Meldrum of the Automobile Club of Buffalo and Secretary F. Howard Mason of the Chamber of Commerce returned this morning from New York, where they had been in an endeavor to persuade the National Association of Automobile Manufacturers to hold a big annual fall show here. Messrs. Meldrum and Mason did not succeed, but that does not mean their plan and the advantages offered were looked upon with disfavor. It was because the manufacturers have decided not to hold a show this fall, believing they would not have time to prepare for one in a proper and advantageous way.

"The manufacturers," Mr. Mason said, "have recently taken action to hold shows in New York and Chicago next winter and did not feel like taking on another one, but we received much encouragement and believe Buffalo will yet secure a great national show. Our idea was not so much to hold an exhibition, pure and simple, as to combine it with an event that would be of benefit to manufacturers by bringing them together in the fall so that they could place agencies, show their new models, trade and generally transact business. It is our belief that such a show in the fall would facilitate the earlier delivery of new cars in the spring."

A Resolution That Settles an October Show.

This is a copy of the resolution adopted by the Executive Committee of the N. A. A. M. at its meeting, May 2, but not given out for print until Tuesday of this week:

"WHEREAS this committee has been waited upon by a committee of gentlemen representing the city of Buffalo, with a view to securing the co-operation of this association in the promotion of a national show in Buffalo in October, which committee has presented arguments intended to demonstrate that such a show would prove beneficial to the manufacturers, be it

"RESOLVED, that in the opinion of this association the promotion of such a show would be inadvisable, for the reasons that it would entail the expenditure of a large sum of money without compensating advantages; that it would prove a disturbing element in a situation at present satisfactory to a large majority of the trade;

that none of the reasons advanced by the gentlemen from Buffalo, or by any other persons, warrant a departure from the recent decision of this executive committee that any shows in addition to those already decided upon are inadvisable; and that such a show could not interest manufacturers to such an extent as to prove creditable to the trade or to the city of Buffalo."

The N. A. A. M. has on record a resolution to the effect that no manufacturer shall be permitted to exhibit at a sanctioned show who has exhibited at an unsanctioned show. It may be taken for granted that if an outdoor, or any other, show is held in October or November, it will not be sanctioned. The Chicago show and the Madison Square Garden show will both be sanctioned. One of the conditions of the sanctions is that the Association's resolution shall be enforced. In other words, that these shows will not permit anyone to exhibit who has taken part in an unsanctioned show.

DELEGATES CONFER WITH A. L. A. M.

While the representatives of the New York State Automobile Association were in New York City last week a conference was had with the A. L. A. M. officers in regard to the proposition that some of the A. L. A. M. show profits be apportioned to the A. A. A. for the purpose of carrying on the national work of the organization. It is understood that Treasurer H. H. Franklin considers some such plan with favor, and it is said that the A. L. A. M. will give it serious consideration.

LABOR DAY RACE AT ROCHESTER, N. Y.

The New York State Automobile Association, with the Rochester Automobile Club looking after the running of the race, will hold a 100-mile road contest near Rochester on Labor Day. The exact details of the race have not been decided upon, except that there will be a substantial prize list with a \$1,000 cup to the winner. It is expected that the race will yield a substantial profit that will be utilized in carrying on the work of the state association.

A circuit of about twenty-five miles in Monroe county has been found suitable, and it is understood that the inhabitants of the section will allow the automobilists to have the exclusive use of it. The race may be run in the afternoon. A resident of Syracuse, N. Y., who is an ardent motorist, has offered a cup valued at \$1,000 for the race. The entrance fee will probably be placed at \$250, and the contest will be open to competitors from any country. It is also intended to run an amateur contest for stripped touring cars, this event to take place in the morning.

FRANCE AND ITS VANDERBILT CUP TEAM.

With no elimination event like that of the Gordon Bennett race of last year, the exact manner in which the French team for the Vanderbilt Cup race will be selected remains undecided. Here is some comment from the *Automotor Journal*, an English source:

"For this race Darracq & Co. are desirous of running two of their cars to represent France. The A. C. de France, however, have already disowned the cup, which was secured last year by a French car, and have announced that they will not take any further part in the contest, as the rules being based practically upon those of the Gordon Bennett race do not give France the preponderating representation to which the French Club considers she is entitled. The question now arises is what will be done to get over the difficulty? Some French makers do not approve of the decision of the A. C. F., as it will be seen, and are willing and anxious to fight, and if possible again secure the trophy. Probably the American authorities will cut the knot by accepting approved entries direct from manufacturers, under the circumstances, instead of only through the A. C. F. as the representative club."

Thirty-two entries have been received for the Scottish Reliability Trial, which starts from Glasgow on June 13.

SPECIAL AUTO STEELS AND THEIR PROPERTIES

By RENE M. PETARD.

IN the direction of the betterment of materials of engineering construction the automobile has occasioned much progress. Really wonderful results have been obtained in automobile development, in reductions in weight and space occupied, previously unknown to engineers, and the scope of mechanical possibilities has been considerably enlarged thereby. The call on the metallurgist for new metals and mixtures has been continuous, and he has risen to the occasion, even surprising himself with the results accomplished and so developing an enthusiasm in research and experiment that has resulted in a remarkable rearrangement of some of the tables of properties of materials.

To the automobilist the results are most strikingly manifested in the tremendous power and ability of modern racing cars, in which, throughout all the advances, the weight has been a constant. A consideration of these new materials is therefore of general interest, and in the following the special mixtures of steel will be discussed, in a simple way, with occasional reference also to some of the more familiar materials of construction.

The Properties of Carbon Steel.

Under the comprehensive term of "carbon steel" is classified a large variety of grades of alloys of iron and carbon, in which the latter is so intimately combined with the former that its presence can only be detected by chemical analysis, this being said to differentiate steel from cast or gray iron, in which the carbon is only partly if at all combined with the iron. Its presence can be detected sometimes by the naked eye, but more generally by the action of acids on polished samples, in which case the carbon which the acid does not alter stands out in particles plainly seen through a magnifying glass.

Carbon steel, which is a combination of only two simple principal elements, sometimes contains infinitesimal quantities of foreign metals. These are sometimes unfavorable to the satisfactory use of the metal, but seldom are of sufficient importance to be taken into account when classifying the material.

In special steels, on the contrary, other components come into action besides those of the carbon steel and give new properties to the metal. Amongst these foreign substances those which so far have had an important part in the production of practically usable combinations are: Silicon, manganese, chromium, nickel, tungsten, molybdenum and vanadium.

Steel Classification and Its Ramifications.

According to the classification generally used by French metallurgists for the purpose we shall consider carbon steel as a "binary" steel. Those metals which contain a third important element besides carbon and iron will be classed "ternary," and those containing a fourth element will naturally be the "quaternary" steels. Considering simply these three large classes and the seven elements already named, it will be seen what a large number of combinations can already be formed even if no account is taken of the proportions in which the constituent elements are added to the basis of carbon and iron. But it should be further considered that these proportions are all important, and that according to them materials of widely differing properties can be obtained; for instance, a 15 per cent. nickel steel bears no relation whatever in physical properties to a 25 per cent. steel. To quote another example, manganese steel had long been the bugbear of metallurgists, who never could obtain anything of it, when came Mr. Hadfield, who produced the remarkable manganese steel bearing his name.

This will give the reader an idea of the infinite number of steels which can reasonably be expected to appear as the time goes, each with distinct properties, and also of the difficulty experienced by the designer even now, when he has to select

amongst the quantity of various materials offered, that which will suit best his particular purpose. Add to this that a mere mechanical operation, or an unforeseen thermic treatment of the material has been known to entirely alter its constitution, and the present almost chaotic state of this newly born branch of applied science will be somewhat realized.

Some Recent Tests by Dr. Guillet.

Some light has been thrown on the subject by the recent work of Dr. Guillet, the head chemist at the De Dion factory, where he is in charge of the testing of the materials received. Aided by the very complete installation of the De Dion laboratories, Dr. Guillet has attentively studied ternary steels and has made public the result of his researches. The process of his studies was as follows: Taking the principal kinds of ternary steels known, and those of the composition of which he was absolutely certain and of which he knew how they could industrially be produced in large quantities, he determined their interesting physical properties, their behavior when case-hardened or tempered, in short, all the possible interesting data, and found that by comparing grades of steel sufficiently close in constitution he could often establish fairly regular diagrammatic curves permitting him to deduct the *likely* (not the absolutely certain) properties of any given combination by comparing with the two nearest ones in the diagrams. These diagrams can only be considered, evidently, as hypotheses which the future, that is, actual experience, will confirm or invalidate, but even then they certainly are useful guides for the present.

Automobile designers in Europe specially use: Nickel steel, silicon steel, and nickel chrome steel. In England vanadium steel is very extensively used.

The richest and best-known class of special steels is that of nickel steel. It has given some extremely satisfactory grades of metal, but also some very disappointing ones; it will consequently be that which we shall most lengthily consider.

The Four Principal Classes of Nickel Steels.

Amongst nickel steels, four principal classes will have to be grouped, according to one of the most important characteristics of a steel intended for industrial use; that is, according to behavior under heat treatment. We shall consider: First, the case-hardening nickel steel; second, the tempering nickel steel; third, the nickel steel on which heat treatment has no effect; fourth, and last, that which softens by tempering.

Casehardening Nickel Steel.—It has long been known that the presence of nickel destroys the cause, whatever it may be, of the brittleness of casehardened carbon steel. This is most evident with a 2 per cent. nickel steel. A 2 per cent. nickel steel, case-hardened and tempered, preserves in its central part the fibrous texture which is a characteristic of a break after flexion and pull. It is equal in this respect to good iron and is the "hickory of steels."

After exhaustive tests, 2 per cent. nickel casehardening steels have become a commercial article in France and are often sold as special steels at abnormally high prices on account of this precious property. Experiments were made in which the percentage of nickel was increased, but the lower price of the 2 per cent. steel made it more interesting for the manufacturer. The security when parts were made with the same proportions as for carbon steel was very great with this 2 per cent. steel; it, however, has several drawbacks.

Two Per Cent. Nickel Steel.

More than carbon steel, the 2 per cent. nickel steel is liable to develop flaws. Forging or rolling have to be attended to with

the utmost care. Further, it was discovered that the hard skin on the outside of the parts was not quite as hard as that obtained on carbon steel after the same treatment. And in large orders, inducing the mill to make a large quantity of metal in one batch, it was found that some parts absolutely refused to harden. The reason for this is as follows: Small quantities were made in crucibles, when very homogeneous products were obtained, but for large quantities the furnace was resorted to, and the result was that the difference in density of the nickel prevented it from thoroughly combining with the steel, leaving spots of pure nickel which evidently would not take case-hardening. A third drawback, which sometimes entirely prevented the use of nickel steels, is the relatively great difference in size which sometimes exists between the untreated finished part, and the same part after case-hardening and tempering.

In carbon steel parts it is often desired to decrease the brittleness caused by casehardening. In order to do this the part is annealed twice (that is, reheated and cooled slowly twice), and tempered at a suitable temperature after each annealing operation. The drawback of this is that the variation in size caused by tempering is doubled by the process. It was expected of the 2 per cent. nickel steel that as the same result as regards brittleness could be obtained with the first tempering operation the variation would be halved. The opposite happened. It was soon discovered that 2 per cent. nickel steel shrinks by tempering. A most striking example was that of the bore of the sliding set in a gear box; this was bored 28 mm., and when measured after tempering and hardening was found to be 30 mm., which naturally led the part straight to the scrap heap and the designer to profanity. This most troublesome phenomenon, being just the contrary of what takes place with carbon steel—which expands by tempering—is worthy of a little explanation.

The addition of nickel to a carbon steel causes it to have a lower temperature of transformation than it had before the addition. By temperature of transformation is meant that above which it is necessary to bring the steel before tempering in order to harden its surface. Or, in other terms, at a temperature of say 900 degrees centigrade, nickel steel will be softer than the corresponding carbon steel, with the consequence that if both are forged or rolled at the same temperature the nickel steel will be more "compound" than the carbon steel, and the heating process before tempering will cause a greater variation in size. This has led experienced makers to forge nickel steel at a lower temperature than carbon steel and to anneal, before machining, when the forging process is finished. In fact, some builders, in order to have the minimum loss when treating expensive parts, go as far as annealing them several times during the machining process.

From the foregoing it will be seen that 2 or 3 per cent. is the correct proportion for a corresponding nickel steel if the most certain results and the most reasonable price are desired. Above this the cost price of the material is considerably increased, and, besides, the steel becomes more brittle. A few steel makers in France recommend 6 per cent. nickel, claiming that parts made of such steel do not vary in size after tempering; there, however, does not appear to be any foundation for such a claim.

A grade of casehardening nickel steel, the composition of which is unknown to the writer, is placed on the market by one particular maker, which has the great advantage of taking by mere casehardening, without tempering, a skin equal in hardness to that of hardened and tempered carbon steel. The advantage of this is obvious, there being no tempering there is no alteration in size, and for the same reason the part does not lose its hardness by accidental heating, when a tempered part would lose its temper very quickly.

This steel is amongst the most interesting grades in this class, but users of it should keep in mind that it cannot be expected to be free from the principal drawbacks of the other grades of nickel steel. As all others, it may show up flaws. Casehardening alone sometimes causes variations in size, especially if the part has not been well annealed before finishing to size. Cooling,

especially if not quite as slow as desirable, is always liable to create internal strains which will possibly warp light parts. The least action resembling tempering which may take place during the process, if not extremely carefully done, is liable to harden the part clean through and consequently make it more brittle than expected.

Tempering Nickel Steel.—Some 2 to 6 per cent. nickel steels are made which can be tempered without casehardening, their elastic limit and their terrible strength are raised by the process; chrome-nickel steels are, however, more interesting in this respect.

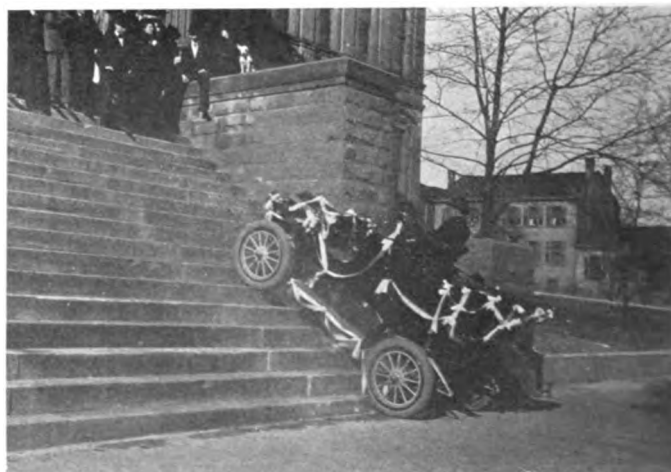
Indifferent Nickel Steel.—These are of medium percentages of nickel; the quantity of carbon contained affecting them greatly, no definite figures can be given. These steels, upon which annealing or tempering have no action, are very difficult to forge or to cut. They can only be annealed between very narrow limits and with special care, and even then the result is very slight. From this it will be seen that they present very little practical interest. They have been practically given up.

Nickel Steel Softened by Tempering.—These are the grades high in nickel. They are rather soft and never are brittle to the least extent. They are impervious to oxidation within practical limit, this quality being that of the nickel of which they contain a large proportion. They also are characterized by their valuable quality of possessing a very low coefficient of expansion when heated, a 25 per cent. nickel steel being absolutely free from expansion at any temperature, being perhaps unique in this respect. The whole of these qualities has made this steel a wonderfully satisfactory material for internal combustion engine valves, and for this reason French makers almost exclusively use it for this purpose. The material employed is very low in carbon and contains from 20 to 33 per cent. of nickel.

(To be continued.)

AUTOMOBILIST CELEBRATES HIS WEDDING.

Just to celebrate his wedding, and incidentally to show his prowess as a driver and his confidence in the Ford, in which he took his bride to the courthouse, a St. Joseph, Mo., chauffeur



BRIDEGROOM HATFIELD DRIVING UP COURTHOUSE STEPS.

furnished excitement for the crowd by running his car up the courthouse steps in that city twice. The car took the grade easily, although it is a climb not to be sneezed at, as the accompanying photograph shows.

A wedding in which the automobile figured prominently was held in Newport, R. I., last month, when Dutée Wilcox Flint and Miss Rose Howard were joined in matrimony. The bridegroom is state agent for the Ford cars, all of the ushers were prominent automobile enthusiasts, and the honeymoon trip was made in an automobile.

A PLAN FOR UNIVERSAL ROAD RULES

By JOHN L. JONES.

THERE seems to be a lack of definite understanding as to the rules and regulations governing the "Rules of the Road." For example, in some parts of the country the rule seems to prevail that cars traveling north or south have the preference at a junction over cars going in other directions. In other places, cars on certain streets, considered as the most important streets, have the preference, or "right of way," over cars on intersecting or cross streets. It may happen that two cars approach a crossing at the same speed on two streets of equal importance. The question suddenly arises, "Who has the 'right of way'?" "Who shall slow down, and who shall hold his speed?" As there is at present no rule covering the point, and when both drivers are accustomed to having their own way, the result is usually disastrous. This leads to another point, viz., "If a collision occurs under these circumstances, where shall the blame fall?"

It is easy to go further. Both drivers may be strangers to the locality—neither knows the relative importance of the street he is on as compared with the one he is approaching. Both may be ignorant as to the direction in which he is heading. This meeting may occur in the night-time, and who shall be responsible when the collision results? There are many other conditions under which uncertainty is dangerous. The automobile is a vehicle whose course may be changed very suddenly and without previous warning to drivers of other cars on the road, and a driver attempting to pass another car from behind may think that the driver ahead has heard him coming, and is turning out to give him room to pass, while in reality he is merely avoiding a rut or mudhole, and may turn back so quickly that a serious accident is unavoidable.

It may happen that just ahead of the point at which a driver may wish to pass another car going in the same direction there is a bridge, obstruction, or narrow part of the road, or some other cause which would make it dangerous to pass at this point. This danger would be appreciated by the driver of the car in front, but would be invisible to the driver of the car behind. In a case like this the former has no means of informing the latter, who may feel that the preceding driver is unreasonable in not allowing him to pass, and may become angry and excited and dash around the side, to the mutual disadvantage and damage of both cars, and, probably, to the drivers and passengers. And then, again, it may be considered by the first driver to be safe for the other car to pass him on one particular side, and highly dangerous to pass on the other side. At present he has no means of conveying this information.

All automobiles are equipped with a horn, whistle, or other device for giving warning signals, but these are used indiscriminately and no attention has been paid to the standardization of these warning signals, or to the adoption of a system of passing signals, which would avoid and prevent accidents and collisions due to uncertainty as to the intentions of "the other man."

Now, it is the purpose of the writer to suggest the universal adoption of a set of rules governing the use of warning and passing signals and signal lights, which has been thoroughly tried out and adopted by the United States Government, for the government of pilots of vessels on the Great Lakes. An adoption of the rules has been carefully made, which is suitable for the conditions obtaining on the road, as applied to automobiles, as follows:

Rules for the Government of Drivers.

Rule 1.—When cars are approaching each other "head and head," or nearly so, it shall be the duty of each car to pass to the right, or on the port side of the other; and the driver of either car may be first in determining to pursue this course and thereupon shall give, as a signal of his intention, one short blast of the whistle, which the driver of the other car shall answer promptly by a similar blast of his whistle, and thereupon such cars shall pass to the right, or on the port side of each other. But, if the course

of such cars is so far on the starboard of each other as not to be considered by the drivers as meeting "head and head," or nearly so, the driver so first deciding shall immediately give two short and distinct blasts of his whistle, which the driver of the other car shall answer promptly by two similar blasts of his whistle, and they shall pass to the left, or on the starboard side of each other. **Provided**—That in all narrow streets, and in all places where there is a considerable hill or grade, the descending car shall have the right of way, and shall, before the cars shall have arrived within the distance of one hundred feet of each other, give the signal necessary to indicate which side she elects to take.

Note.—In the night, cars will be considered as meeting "head and head," or nearly so, so long as both the colored lights of each are in view of the other.

Rule 2.—When cars are approaching each other in an oblique direction, as shown in the diagrams of Fourth and Fifth Situations, so as to involve risk of collision, the car which has the other on her own starboard side shall keep out of the way of the other, which latter car shall keep her course and speed. The motor car having the other on her starboard side indicates by one blast of her whistle her intention to direct her course to starboard, and two blasts if directing her course to port; to which the other shall promptly respond, but the giving and answering of signals by a car required to keep her course shall not vary the duties and obligations of the respective cars.

Rule 3.—If, when cars are approaching each other, the driver of either car fails to understand the course or intention of the other, whether from signals being given or answered erroneously or from other causes, the driver so in doubt shall immediately signify the same by giving several short and rapid blasts of the whistle; and if the cars shall have approached within one hundred feet of each other, both shall be immediately slowed to a speed not greater than eight miles per hour until the proper signals are given, answered and understood, or until the cars shall have passed each other. Cars approaching each other from opposite directions are forbidden to use what has become technically known as "cross signals"—i. e., answering one whistle with two, and answering two whistles with one. In all cases, and under all circumstances, a driver receiving either of the whistle signals provided in the rules which for any reason he deems injudicious to comply with, instead of answering it with a cross signal, must at once observe the provisions of this rule.

Rule 4.—Whenever a motor car is nearing a short bend or turn in the road, where, on account of the presence of buildings, trees, or from some other cause, a car approaching from the opposite direction cannot be seen for a distance of two hundred feet, the driver of such car, when he shall have arrived within one hundred feet of such bend or turn, shall give a signal by one long blast of the whistle, or five short and rapid blasts of the whistle, which signal shall be answered by a similar signal, given by the driver of any approaching car that may be within hearing. Should such signal be so answered by a car upon the farther side of such bend, then the usual signals for meeting and passing shall immediately be given and answered, but if the first alarm signal of such driver be not answered, he is to consider the road clear and govern himself accordingly. When cars are moved from a position of rest, and other cars are liable to pass from any direction toward them, they shall give the same signals as in the case of cars meeting at a bend; but immediately after getting in motion they shall be governed by Rule 1.

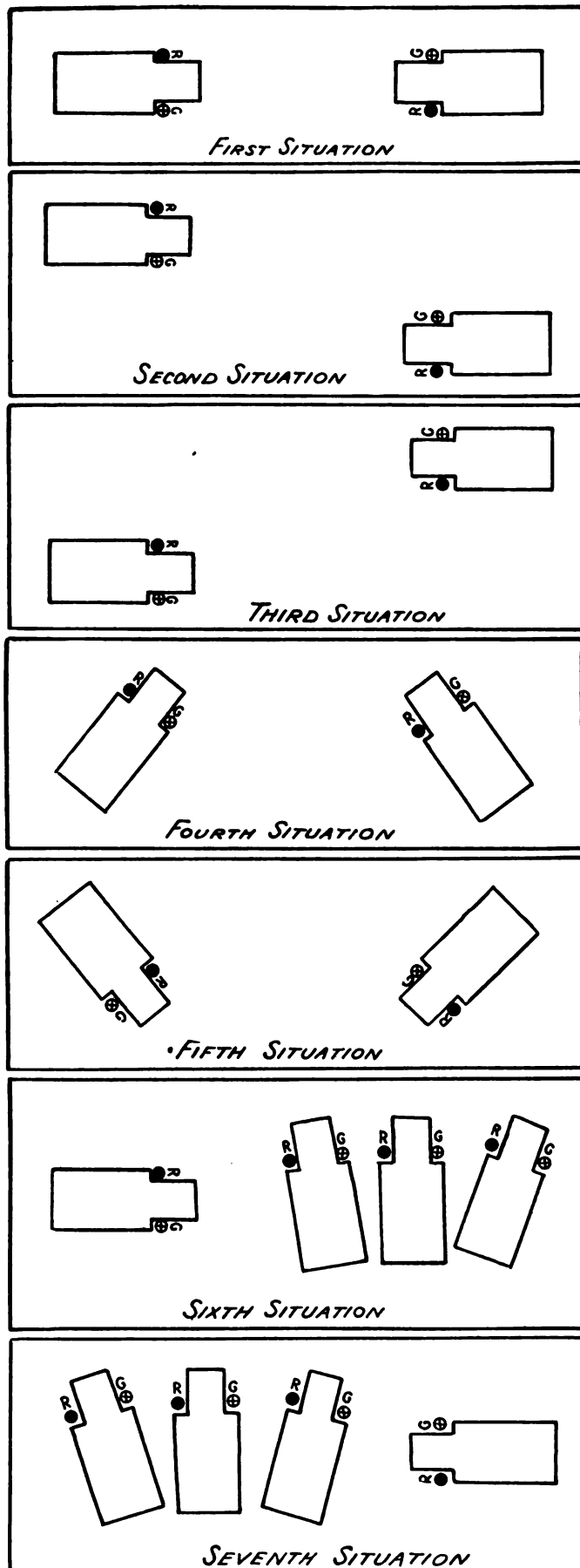
Rule 5.—The signals, by the blowing of the whistle, shall be given and answered by drivers, in compliance with these rules, not only when meeting "head and head," or nearly so, but at all times when passing or meeting at a distance within one hundred feet of each other, and whether passing to the starboard or port.

Rule 6.—When motor cars are running in the same direction, and the driver of a car which is behind shall desire to pass on the right hand or starboard side of the car ahead, he shall give one short blast of the whistle as a signal of such design and intention; or if he shall desire to pass on the left hand or port side of the car ahead, he shall give two short blasts of the whistle, as a signal of such desire and intention, and the driver of the car ahead shall answer by the same signals; or if he does not think it safe for the car behind to attempt to pass at that point, he shall immediately signify the same by giving several short and rapid blasts of the whistle, and under no circumstances shall the car behind attempt to pass the car ahead until such time as they have reached a point where it can be safely done, when said car ahead shall signify her willingness by blowing the proper signals. The car ahead shall in no case attempt to cross in front of or crowd upon the course of the passing car. Every automobile coming up with another car from any direction more than two points "abaft her beam"—i. e., in such a position in reference to the car which she is overtaking that at night she would be unable to see either of that car's side lights—shall be deemed to be an overtaking car; and no subsequent alteration of the bearing between the two cars shall make the overtaking car a crossing car within the meaning of these rules, or relieve her of the duty of keeping clear of the overtaken car until she is finally passed and clear.

N. B.—The foregoing rules are to be complied with in all cases except when cars are moving in a crowded street; under such circumstances cars must be run and managed with great caution, sounding the whistle as may be necessary, to guard against collision or other accidents. In construing and obeying these rules due regard must be had to all dangers of driving, and to any special circumstances which may exist in any particular case rendering a departure from them necessary in order to avoid immediate danger.

Rule 7.—When cars are running in a fog or thick weather, it shall be the duty of the driver to cause three distinct blasts of the whistle to be sounded at intervals not exceeding one minute. An automobile hearing, apparently not more than four points from right ahead, the fog signal of another car, shall at once reduce her

CHART SHOWING SITUATIONS OF LIGHTED CARS.



R, indicates position of Red Light.
G, indicates position of Green Light.

speed to not more than six miles per hour, and proceed with great caution until the cars shall have passed each other.

Red and Green Signal Lights.

The lights mentioned in the following rules shall be carried in all weathers from sunset to sunrise. The word "visible" in these rules, when applied to lights, shall mean visible on a dark night with a clear atmosphere.

(A) On the starboard, or right-hand, side, a green light, so constructed as to throw an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points "abaft the beam" on the starboard side, and of such a character as to be visible at a distance of at least several hundred feet.

(B) On the port, or left-hand, side, a red light, so constructed as to throw an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points "abaft the beam" on the port side, and of such a character as to be visible at a distance of at least five hundred feet.

The said green and red lights shall be fitted with inboard screens projecting at least two feet forward of the light, so as to prevent these lights from being seen from any point other than that part of the horizon as specified in rules (A) and (B) relating to lights. This is important, for without the screens any plan of signal side-lights would be ineffectual as a means of indicating the direction of steering. This will be readily understood by a reference to the illustrations, where it will appear evident that in any situation in which two cars may approach each other in the dark the colored lights will instantly indicate to both the relative course of each; that is, each will know whether the other is approaching directly, or crossing her course either to starboard or port. This intimation, with the signals by whistle as provided, is all that is required to enable cars to pass each other in the darkest nights with almost equal safety as in broad day.

First Situation.—In this situation the two colored lights will be visible to the driver of each car, which will indicate their direct approach "head and head" toward each other. In this situation it is a standing rule that both shall pass to the right, each having previously given one blast of the whistle.

Second Situation.—In this situation the green light only will be visible to the driver of each car. They are, therefore, passing to starboard, which is ruleable in this situation, each driver having previously signified his intention by two blasts of the whistle.

Third Situation.—In this situation the red light only will be visible to the driver of each car. Both cars are evidently passing to port, which is ruleable in this situation, each driver having previously signified his intention by one blast of the whistle.

Fourth and Fifth Situations.—When cars are approaching each other in an oblique direction, as indicated by the diagrams of the fourth and fifth situations, so that a continuation of their courses would involve risk of collision, the vessel which has the other on her own starboard, or right hand, side shall keep out of the way of the other, and shall, if necessary to do so, slacken her speed, or stop; indicating her intention by either one or two blasts of the whistle, as circumstances may require, and in accordance with Rule 1 of the Drivers' Rules.

Sixth and Seventh Situations.—A car approaching another crossing her course at or nearly at right angles, as represented in the diagrams of the sixth and seventh situations, shall, if approaching the crossing car so near as to involve risk of collision, turn to the right, when seeing only the red light of the crossing car, and turn to the left if only the green light is in view; at the same time, slow, or stop, if necessary, each car to give the whistle signals as provided in Rule 1 of the Drivers' Rules, the crossing car to keep her course and speed.

INCORPORATES FOR \$1,000,000.

Articles of incorporation were filed recently by the Korbusch Automobile Company, of St. Louis, Mo., which was formed sixteen months ago and exhibited an American Mors at the New York show last winter. The capital stock is \$1,000,000, divided into 10,000 shares, of which George J. Korbusch owns all but three. The other stockholders are Harry F. Vogel, vice-president of the St. Louis Car Company; George A. H. Mills, general manager, and W. S. Miller, manager, of the automobile plant. The plant now employs 400 workmen in the construction of cars after the Mors patterns. Mr. Korbusch is president of the St. Louis Car Company, which is one of the largest builders of railroad and street cars in the country.

TIRES LAST ONLY 400 MILES IN SPAIN

SPAIN is a country which in great degree attracts many automobilists, though few venture over its rugged roads, possibly for the most part because they know little or nothing of the country, and information concerning it is not plentiful. An automobilist who has toured extensively over Europe gives facts and figures that are decidedly interesting. Answering as to the best way of travel in Spain, by train or automobile, he states that it is a question of individual judgment. If by train, one will not see "the local color." The cars are dirty, the service poor, and the trains slow. If by automobile, one will find Spain about the most expensive country of western Europe to tour in. A tire will last for about 400 miles, gasoline costs from 68 cents a gallon in the north to twice that in the south, with other supplies high.

As to the most desirable season in which to make the trip? The northern part of Spain consists of a series of plateaus having

The rules of the road require one to keep to the left, but the only things that seem to obey them are the trolley cars, everything else going where it wills. It is a good thing to have a siren or Gabriel horn on one's car, as the only wagons seen in the country are two-wheeled and drawn by five or six mules hitched tandem. The driver is invariably asleep and must be awakened.

In automobile supplies, anything in the ordinary, including tires, can be purchased in San Sebastian and Madrid. Gasoline and oil, since the King has taken up automobiling, can be found in nearly every fair-sized town, as storekeepers are all in hopes that some day he will visit them in his automobile.

The roads in the north are macadam, but as they have not been resurfaced in many years, and the only work done on them consists of filling some of the holes with a little broken stone taken from the piles which line the sides of every road, and which are



WHEN THE KING OF SPAIN TOURS ABOUT THE COUNTRY THE ROAD IS USUALLY WELL GUARDED.

an elevation of about 2,000 feet. (Bungos is 2,790 feet and Madrid 2,140 feet above the sea.) As there are no trees on these plateaus to break the force of the wind, it is either very hot or very cold. That puts the summer and winter out of the question. In the spring the crops make the scenery more attractive than in the fall, when the lack of foliage makes everything seem barren.

There are agents at the Spanish custom house at Irun who will for a nominal fee (about \$5) guarantee the custom charges. If one pays them they are returned, less a small charge for tires used, on leaving the country. There are, however, custom charges and road taxes to be paid when entering the various provinces, which are not returned. They are for small amounts, however.

The French licenses are all that are required, so there is no necessity to take out official Spanish papers for the automobile.

constantly being added to, the results on the tires can easily be imagined. Anyone making the trip should use old tires as an additional covering to the new ones, and carry as large a stock of extras as possible. South of Madrid the roads are bad beyond description. As one cannot get good carburation in high altitudes with the best of gasoline without adjusting the carbureter, and as poor gasoline makes it all the worse, no one should try to go south of Madrid, if that far, in less than a thirty-horsepower car.

The ordinance department publishes a map of Spain, but there are so many parts required for one day's run that they entail endless confusion. There is, however, an "Atlas De Obras Publicas De Espana," mounted on cloth and about forty by fifty inches in size, that gives about all the information required. Tiraide, of Paris, is going to publish maps covering Spain.

AMERICAN PNEUMATIC WHEEL.

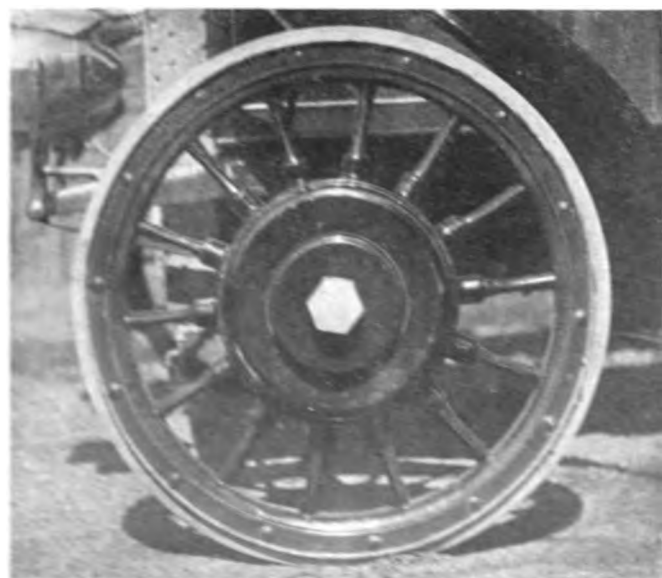
With the expressed intention of diminishing the liability to accident, and the depreciation incidental to the regular wear of the ordinary pneumatic tire, the American Pneumatic Wheel Company, of Lorain, Ohio, for the past two years has been developing a special design of automobile wheel, and has met with very encouraging results. The first set of wheels, built during the winter



PNEUMATIC WHEELS FITTED TO WHITE STEAM CAR.

of 1904 and 1905, were installed on a White car, and run about 500 miles. No trouble developed with either pneumatic tire or driving device, and subsequent changes made were for the purpose of reducing weight or improving appearance. This first set of wheels was equipped with solid rim tire of Firestone pattern. During the season of 1905 a set of wheels was finished with steel tires. These proved satisfactory as to resiliency, but were somewhat noisy on paved streets.

It will be noticed by the cross-section illustration that the pneumatic tire that is enclosed in the hub of the wheel is of small diameter and consequently inexpensive, while it has proven very durable in the experiments made. The wheel equipped with a



ENLARGED VIEW OF WHEEL SHOWING EXTERIOR.

small pneumatic tire, the makers state, seems to run longer than the ordinary pneumatic tire, and the reason for this is that these wheels are a perfect circle and do not flatten on the road. The wheels are somewhat heavier than the ordinary pneumatic tire, but it is not believed that this will prove an objection in any way, as the ordinary

The designers invite attention to the following points in the construction of the wheel which will probably assist the reader to a more complete understanding of the illustration presented.

The small spool or wheel *A*, which carries the pneumatic tire, is free to revolve in either direction. It turns freely upon the axle sleeve *B*, and is designed to protect the pneumatic tire from driving strains and friction. The load on the tire is distributed over practically one-half its circumference, since it rests in the circular shell, or main hub *C*, of the wheel. The argument is, that the tire can be run very soft, and is thus relieved of the strain due to high air-pressure. The makers have adopted a light single tube tire for this service, and on a standard five-passenger car the tires are pumped slightly harder than the ordinary bicycle tire. A quantity of dry graphite is placed within the shell or main hub for lubrication.

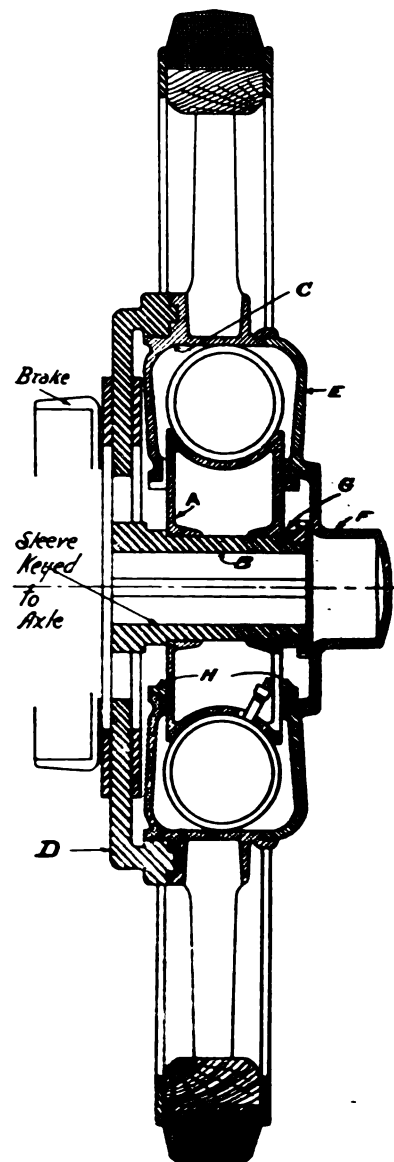
The main hub or shell *C* is a bronze casting having the tapered sockets for spokes cast on its periphery, and for the rear wheel is provided with lugs for attaching the driving device *D*. This casting is threaded to receive the aluminum side plate *E*, which forms the outer face of the hub. Into the side plate is screwed an aluminum cover plate *F*, which is provided with a hexagonal projection to facilitate removal for pumping up tires.

A device is furnished with this wheel which, it is claimed, entirely eliminates tire troubles while on the road. In case the pneumatic tire should burst or otherwise prove defective, it is only necessary to remove the central cover plate *F*, also the nut *G* on end of sleeve *B*, and place a washer on the sleeve, against the wheel or spool *A*, which carries the pneumatic tire. This washer will center the wheel and remove the load entirely from the pneumatic tire, which

may be repaired or replaced whenever convenient. In the meantime the wheel is running on the solid rim tire. Two of these washers are furnished with each set of wheels.

The outer faces *H*, which form a sliding contact with the small wheel or spool *A*, are high-grade bronze castings, and are so constructed that they may be easily removed. The device for transmitting the driving power from the rear axle to the circular shell or main hub *C* of the wheel is constructed of forged steel, case hardened, and all moving parts are fitted with roller bearings.

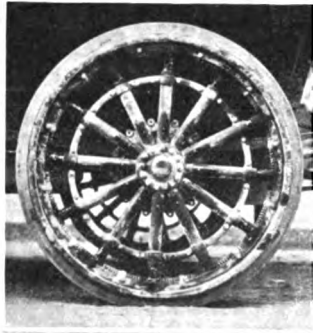
The entire business is in the hands of the American Pneumatic Wheel Company, incorporated under the laws of Ohio, with sufficient capital to take care of the manufacture and marketing of this product.



CROSS SECTIONAL VIEW.



YBERTY-MERIGOUX.



MONNIN-DAMIDOT.



HALLE SPRING WHEEL.



EDMOND LEVY.

RESILIENT WHEEL COMPETITION.

Results that may prove of considerable importance to the trade were manifested in the interesting road competition for resilient wheels, from Paris to Nice and back, inaugurated by *L'Auto*, the Parisian automobile daily paper. The last week in April was devoted to the contest, and eight or ten different types of wheels were represented, mounted on such well-known cars as the Mercedes, Panhard, Decauville, Gobron-Brillie, Renault, and

put to the severest possible test on account of the drains that cross the roads. Several of the wheels were put out of commission, but most of these troubles were caused by the cars themselves. Only four succeeded in reaching Valence within the stipulated time, these being the Hallé, Garchey, E. L. and Soleil. Several others, however, continued the journey unofficially, and on the return journey from Nice the Ducasble had got back in the placings and one of the Hallés had dropped out, while the



GOBRON-BRILLIE CAR EQUIPPED WITH HALLE WHEELS.

others. In a general way all the wheels comported themselves satisfactorily, and the Garchey and Hallé types are credited with having developed splendid qualities. The speeds attained on cars of middle power were very good.

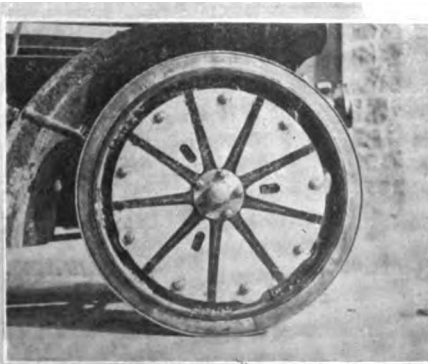
On the first day of the trial it rained hard and the roads were in bad condition, but average speeds of 45, 50 and 55 kilometers were attained. Cars fitted with Hallé wheels were the first to arrive at Dijon, and these wheels again showed up prominently the second day, from Dijon to Valence, where the systems were



HOW THE DARRACQ LOOKS WITH MONNIN-DAMIDOT WHEELS.

Garchey, which had been leading up to Toulon, lost time through an accident.

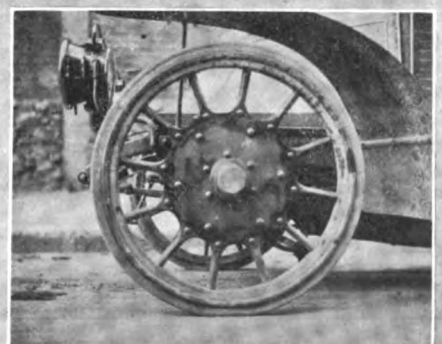
From the advices so far received concerning the competition it is impossible to form a definite opinion as to the material results of the contest and its bearing on the future of that branch of the industry. There must have been great difficulty in classifying the wheels, when the regularity of their operation depends so materially upon the cars, and many competitors were unfortunate through no fault of their own.



THE GARCHEY WHEEL.



HALLE ON GOBRON-BRILLIE.



SOLEIL TYPE OF WHEEL.

CONGRESS HEARS MORE GOOD ROADS TALK

WASHINGTON, D. C., May 7.—The agricultural appropriation bill as it passed the House of Representatives carries with it an appropriation of \$60,000 "to enable the Secretary of Agriculture to make inquiries in regard to the systems of road management throughout the United States; to furnish expert advice on road building; to make investigations in regard to the best methods of road making, and to investigate the chemical and physical character of road materials, etc." During the consideration of this item Representative Watkins made a short speech in which he referred to the matter in these words:

"The bill seeks to have appropriated for experiments looking to the betterment of our public highways \$60,000. If it were for \$60,000,000 for building good roads throughout the length and breadth of these United States, it would meet with my most hearty approval and earnest support. Nothing is more conducive to the material upbuilding of a country than good roads, and nothing more destructive to the financial welfare of the agricultural interests of the country than the miserable highways over which the agricultural products have to be transported. At some future time I shall present this question for consideration, and trust to be able to demonstrate that the advantages to be derived by all classes from the construction of good roads will more than compensate for all the expense incident thereto.

"At this time suffice it to say that the building of good roads will do more to bring the people together in fraternal relations, to promote their educational facilities and their religious zeal, to extend the trade and commerce of the country, and add more to their happiness than anything else. Good roads save money, time, labor, and annoyance. They are conducive to the social development of the people, enhance property values, and beget a spirit of contentment among the people, cementing them in a more compact union, and imbuing them with a spirit of patriotism, making better citizens in time of peace and producing out of them heroes in the time of war."

During the consideration of this item of the bill an attack was made on the office of Public Road Inquiries, but a number of members came to its defense and the appropriation was made. It is interesting to note in this connection that the appropriation this year is \$10,000 greater than it was last year.

THE GROWING TIDE FOR GOOD ROADS.

From Greenville, O., comes news similar to what accrues from other parts of the country: "The Good Roads Club held a large and enthusiastic meeting. The object and purpose of the organization is to enlist the support and influence of representative citizens in an effort to procure better roads throughout the country of Darke and state of Ohio. Clubs have been formed throughout the state for the same purpose, and by co-operating legislation will be enacted which will systematically give to the people thoroughfares which travel and public facilities demand."

This is the way one man sizes up the situation: "No other civilized people would have tolerated the deplorable road conditions that we have in this country half so long as our people have tolerated them, and no other people would have complacently viewed the prodigal use of the public money for every other enterprise while the government they sustained went utterly to sleep as regards this momentous question of better roads."

Three hundred and ninety miles of macadam roads will be constructed in New York state during the next twelve months, the necessary measures agreed upon by the state authorities, the state grange, and the automobile clubs, for the improvement of the state highways under the provisions of the constitutional amendment having been adopted before the legislature adjourned

last week. By these provisions the state is empowered to borrow \$50,000,000 on bonds issued from time to time as the money is required. For the present year \$5,000,000 may be used, each county to have a share for the mileage of unimproved roads.

Governor Mead of the state of Washington has gone on record as favoring convict work on state roads. Recently he received a communication from the Connecticut prison board, asking his co-operation in opposing the bill before congress, which proposes to abolish the interstate transportation of prison-made goods. Governor Mead has replied, saying that he favors the bill, and any measure that will restrict placing prison labor in competition with free labor. He adds that the state can find abundant employment for its convicts on the roads and public work of that character.

At a meeting of the executive committee of the Michigan Good Roads Association, at Lansing, it was decided to hold the next convention at Jackson the second Wednesday and Thursday of next January. It was decided that the president of the association should appoint an organizer, whose work should be to visit the different counties and interest the people on the good roads work. In a short speech to the members, President Todd stated that politics will play no part in the good roads program. He urged the formation of township associations so that when it becomes necessary for the state association to go to the legislature for assistance it will find good sentiment behind the movement all over the state.

OHIO ROAD COMMISSIONER'S REPORT.

The first annual report of the State Highway Department of Ohio, for the period from February 15 to November 15, 1905, has just been issued by Sam Huston, Commissioner. It shows that the first appropriation was made available on February 15, and, as the official year ended November 15, the work during this first nine months was mostly preliminary. Up to the latter date the testing laboratory for testing road materials at the Ohio State University was not yet ready for work. Neither had an Assistant Commissioner been appointed. All the county authorities had been circularized from one to four times in an effort to obtain statistics as to cost of construction and maintenance of the roads of the State, but the results were very unsatisfactory. The Commission issued four bulletins during the first year of its existence, and the Commissioner made useful investigations along several different lines, but the actual work of road improvement under the State bureau can hardly be said to have fairly begun yet. Under the law, County Commissioners were permitted to hold back applications for State aid until the last day of December. Commissioner Huston thinks that the legal percentage of 25 per cent. given by the State toward cost of construction is insufficient inducement to the counties, as that allowance will not meet the extra expense of good, permanent construction.

The Morristown (N. J.) "bumps" are proving very effective in checking the speed of the many automobiles that pass through that city on the pleasant Sundays with which the Metropolitan district is being blessed this spring. It has become a popular form of amusement for the residents to congregate wherever these bumps are located to see the fun. The bumps rise five inches above the level of the road surface and are built of trap rock and clay. No unfair advantage is taken of the automobilists, as signs warning travelers of the presence of the bumps are placed at each end of the town. Despite contemptuous smiles and the quick slowing-down of cars, the bumps sometimes throw the rear wheels of a car off the ground, and goggles, hats, sidecombs, and other loose articles fly about in all directions, while loose spares and tools rattle merrily.

FROM LOS ANGELES TO THE CITY OF DESPAIR

By FREDERIC PABST.

SAN FRANCISCO, CAL., May 5.—It was with Capt. H. D. Ryus, Bert Dingley, and Walter White that I made the run in a White steamer from Los Angeles to stricken San Francisco, a distance of 500 miles. It was a run never to be forgotten, over the most beautiful mountain passes in the world and down into valleys where nature has outdone herself. A party of four men rushing through the country at top speed to reach the scenes of horror in a destroyed city would hardly be in the mood to enthuse over the glories of nature, but such picturesque scenery is seen nowhere but in California. Walter White was in our party. He has toured Germany, Switzerland, England, Ireland, and almost every other picturesque land. Our car had been plugging its way over mountains all night long.

Starting from Los Angeles at 7 in the evening, we had climbed Cahuenga Pass, topped Calabassas Grade, and boomed along to the Canejo. The night was dark, and it was early morning before a small slice of the moon peeped over the mountain tops just a couple of short hours before Old Sol chased the shy moonbeams to their day retreat, but the lights picked out the way over the mountain grades down into the valley. It must have been a queer sight for the farmer boy who chanced to look up into those high mountains and see two fiery eyes winding their way down at the pace we were going.



WALTER WHITE AND HIS SOLDIER COMPANION ON DUTY.

The car took the El Rio sand like a bird, and on we rushed to Ventura. Only a brief stop was made here, and the faithful car struck out for the hard climb over Casitas. There were four streams to ford to the Ventura river, but not once did the car hesitate and the climb was on. It was too dark to enjoy the beauties of the Casitas, but morning was to dawn on an even more beautiful valley, that which stretches out beyond the Gaviota Pass. This is not treason to Southern California, for this beautiful valley is but forty miles beyond Santa Barbara, and is part of our Southland. In those awful hills beyond Santa Barbara our Prest-o-Lite lamps gave out, and we were left with two weak coaloil lamps. But we were out to reach San Francisco, and Captain Ryus picked the way over the dangerous roads at a fair clip. The Gaviota Pass was climbed in the early morning, and at the top, as our eyes beheld the beautiful valley below, the sun swept over it, emphasizing its beauties. Captain Ryus brought the car to a stop as he beheld the beautiful scene, and we were startled by a shout from White. He was standing in the machine cheering, cheering for nature and her work. The young Easterner's love for the beautiful was touched. He was hardly conscious of that shout; it came from the soul. It is no wonder autoists who once make the trip between San Francisco and Los Angeles never tire of it. It is one of the grandest auto tours in the world. The blase individual who is always dis-

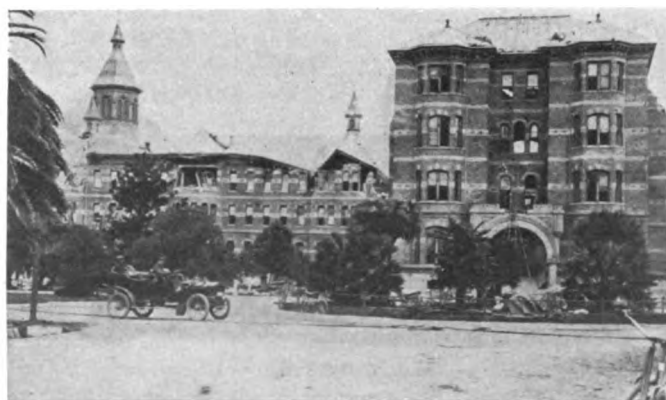
appointed and has begun to believe no sight can affect him, should take this journey. Not only one valley, but there are half a dozen, each one as beautiful as the others. For a hundred miles the road winds through a natural park, beautiful and grand.



RUINED ENTRANCE TO STANFORD UNIVERSITY.

It was the automobile that saved the day in San Francisco. With houses tottering, flames sweeping away the business district, the street cars out of commission, and the people in a panic, it was the automobile which solved the problem of rapid transit and brought order out of chaos. The telephone and the telegraph were useless. It was a journey of hours from one part of the stricken city to the other for a horse. There must be some way to organize the forces which were to calm the city, protect the panic-stricken, and convey physicians and nurses to the injured. In that hour of hopelessness and need came the automobile. The injured were carried to the hospitals with the utmost speed, aid was brought to the injured, and the tonneau of the big cars carried away many a dead body.

The men who came to the front with the necessary genius for organization found the automobile an absolute necessity. Almost from the hour of the first shock the authorities took charge of the automobiles. With the first excitement over, it was recognized that much would depend upon the number of automobiles available, and every effort was made to save as many machines as possible. As a result the loss in automobiles was not large. With the cars saved, the next thing was the gasoline with which to run them, and throughout the city officers and soldiers hur-



RUINS OF THE STATE INSTITUTION AT SAN JOSE.

ried, taking possession of all gasoline. For the first few days before more fuel could be shipped in, gasoline was dealt out sparingly. Tires were also guarded by the regulars, as the rubber tubes soon wore away after hours of rushing over fallen bricks.

The maker of the best machine on earth would never have consented to his car being put to such a test as every machine in running order was forced to undergo in San Francisco. Never before in the history of automobiles were cars asked to do what the automobiles of San Francisco were forced to do in the stricken city.

Captain H. D. Ryus, of Los Angeles, rolled into San Francisco after having completed a 500-mile journey with but few stops. An officer took charge of the machine.

"That car has run 500 miles during the last two days," said Ryus. "Don't you think a little adjustment would make an improvement?"

"No time now for adjustment," said the officer. "This car is needed and it has to run." And that White steamer responded nobly, running hundreds of miles over the brick-covered streets.

In those stirring times the usual cautious driver became a regular daredevil. I had rides which for hair-raising escapes could not be equaled. To rush down Broadway at midday going 25 miles an hour would be a hammock ride compared with some of the dashes I took down Market street, over fallen debris and through lanes of panic-stricken people, rushing to get out of San Francisco and away from the scenes of desolation and misery.

Were it possible to name the drivers of all these machines there would be a long list of heroes. Many a man drove his car three and four days without a minute's rest. C. A. Hawkins, the White agent on the Coast, did not close his eyes for sixty hours. Walter White, the young millionaire from the home of the White car, made the long trip from Los Angeles to San Francisco and then jumped in and drove a car for hours and hours without a rest. Hawkins and White were two of the heroes, and there were many more.

The repair men should not be forgotten. Many cars were operated by inexperienced hands, and many a machine gave out momentarily under the strain. The repair men worked night and day. As quick as a car let down it was repaired and sent on its errands of mercy and protection once more.

No more thorough demonstration of the usefulness of the automobile could be asked. No more convincing argument that the auto is a necessity and not a luxury could be made.

WHAT THE BIG VEHICLES ACCOMPLISHED.

From the San Francisco agents of the Knox Automobile Company comes the story of what the Knox did in time of need:

"The United States Government confiscated our garage, which was miraculously saved, the fire burning around us on all sides, but we were neither affected seriously by earthquake or fire. We had in stock livery machines of our own to the number of a score, and these were impressed into service. The work which they accomplished was enormous. The 2,500-ton wagon, usually used in carrying the United States mail, was of inestimable service in caring for the dead, dying, and wounded. As soon as the president of the Mobile Carriage Company arrived at our place of business after the earthquake, he immediately offered to the city all our vehicles, and the general utility of the Knox corps demonstrated the great worth of automobile transportation."

The San Francisco agents of the Packard Motor Car Company were instrumental in forming the "State Courier Service," which has been conducted in the stricken city under the supervision of the Governor. In its letter the Pacific Motor Car Company sends this information:

"We have demonstrated the practicability of the Packard truck to the satisfaction, we think, of everybody in San Francisco. You cannot and never will be able to realize what has happened here of late, and I wish it was in my power to illustrate to you the good work that the truck did early in the game. We used it to haul out the injured, as we could drive it up close to the fire where horses were not able to stand the heat. Then we put it in the Red Cross service, and it is now in the state courier service. We also have a number of Packard touring cars in the service."

THE AUTOMOBILE CALENDER. AMERICAN.

Shows.

- May 14-19—New Orleans (La.) Automobile and Motor Show.
May 24-26—Open Air Show, Empire City Track, New York Trade Association.

Tours.

- May 30...—Endurance Run, Salt Lake City to Ogden, Utah. Bert Fuller, Manager, Salt Lake City.
June 6...—Orphans' Day, Second Annual Celebration by the New York Motor Club.
June 16-18—Three-Day Tour, Bay State Automobile Association, Boston to Rye Beach, N. H.
June 18-23—Second Annual Economy Test, New York Motor Club.
June 21-26—Second Annual Tour, Albany Automobile Club, Albany to Boston and Return.
July 14...—Annual A. A. A. Tour, Chicago to Bretton Woods, N. H. Rules for the Glidden Trophy operative from Buffalo.
Sept.—Endurance Run, Denver to Colorado Springs, Centennial Celebration Discovery of Pike's Peak.

Race Meets and Hill Climbs.

- May.—Richmond, Ind., 10-mile Obstacle Road Race, Wayne County Automobile Club.
May 10...—Wilkes-Barre (Pa.) Centennial Jubilee Hill Climb.
May 10-12—Macon, Georgia, Race Meet, Macon Automobile Club.
May.—Michigan Hill Climb, at Indianapolis, Ind. (exact date to be announced).
May 24...—Dead Horse Hill Climb, Leicester, Mass., Worcester Automobile Club, (Chester I. Campbell, Manager, 5 Park Sq., Boston).
May 30...—Boston Annual Meet of the Bay State Automobile Association, Readville Track.
May 30...—Baltimore (Md.) Race Meet, Maryland Motor Exhibition Association.
Sept. 22...—American Elimination Trials for Vanderbilt Cup Race (Long Island Course probable).
Sept.—Colorado Springs, Two-Day Meet, Centennial Celebration Discovery of Pike's Peak.
Oct. 6...—Vanderbilt Cup Race, American Automobile Association.

FOREIGN.

Shows.

- Oct. 5-14—Leipzig (Germany) Exhibition, Krystall Palaet.
Nov. 1...—New Zealand International Exhibition opens at Christchurch.
Nov. 1-16—Berlin (Germany) Automobile Exhibition.
Nov. 15-24—London, Olympia Motor Show.
Nov. 23-Dec. 1—London, Stanley Show, Agricultural Hall.

Tours.

- May 12-13—International Light Touring Car Competition, Vienna to Gratz and back. Austrian Automobile Club.
May 13-14—Tour de France. Motorcycles and voiturettes.
May 15-16—Le Coupé d'Or and International Automobile Congress, at Milan, Italy.
June 5-13—Herkomer Cup Touring and Speed Trials, Munich, Bavaria.
June 11-16—Land's End to John O'Groats. Auto Cycle Club of Great Britain.
June 13-16—Scottish Reliability Trials.
July 29-Aug. 15—Circuit Européen, 3,000 miles, Paris, Milan, Vienna, Berlin, Cologne, Paris.

Race Meets and Hill Climbs.

- May 27...—Motor Cycle Club of France, Championships.
June 26-27—Le Grand Prix, Sarthe Circuit, France.
July 8...—International Cup Race for Motorcycles, Cesky Club Motocyclistů of Austria.
July 15...—Suze-Mont Cenis Hill Climb (Italy). Automobile Club of Turin.
Aug. 1-15—Circuit des Ardennes (Belgium).
Aug. 15-16—Ventoux (France) Automobile Meeting.
Aug. 14-19—Ostend (Belgium) Meet.
Aug. 23...—Semmering Hill Climb.
Aug. 27-Sept. 2—Brescia (Italy) Automobile Meeting.
Sept. 27...—Tourist Trophy Race, Isle of Man, Auto Club of Great Britain.
Oct. 7...—Chateau Thierry (France) Hill Climb.
Oct. 28...—Gaillon (France) Hill Climb.

THINGS GOING ON AMONG THE CLUBS

New England Interested in Dead Horse Hill Climb.

WORCESTER, MASS., May 7.—Entry blanks for the Dead Horse hill climbing contest on May 24, under the auspices of the Worcester Automobile Club, were issued last week. There will be twenty-two events in all, the first of which is for the Amateur championship of Worcester county, open to all stock cars, owner or regular chauffeur to drive. This rule applies to all the other amateur events, which are twelve in number. The second and third events are for steam vehicles, and the balance for gasoline cars of the various sizes and weights, with the exception of the last event, which is open to all makes of cars.

Dead Horse Hill, the scene of the contest, is located on Stafford street, about three miles from the Worcester city hall, on what was originally the old Boston and Hartford turnpike. The mile course commences at the works of the Standard Plunger Elevator Company, near Jamesville Station, and runs southwesterly across the city limits into the town of Leicester, about three-fourths of a mile to the east of the hill. Contestants will report to the clerk of the course before one o'clock on the day of the climb, who will be stationed at the corner of Ludlow and Stafford streets, with a red flag. All cars will be given a running start of 200 feet on a down grade.

The following are the principal officials chosen for the hill climb: Referee, Lewis R. Speare, president Bay State Automobile Association, Boston. Judges, Elliott C. Lee, president Massachusetts State Automobile Association, Boston; H. E. Fletcher, president Lowell Automobile Club; President Haynes, Springfield Automobile Club; William H. Chase, Wachusett Automobile Club, and the presidents of the Brockton and Providence Clubs. Timers, F. L. Murdock, A. H. Inman, G. B. Cutting, C. L. Chamberlain, J. F. Lancaster. Clerk of the course, Secretary Frederick L. Frost. Starter, Alfred Thomas. Marshal, President John P. Coughlin.

Last year big crowds of automobilists lined the course, and if present indications are reliable, the vicinity of the climb this year will witness an increase in the number who will witness the contest. The hill is just one mile in length and varies in grade from 8.3 to 12 per cent., so that the machines that cover the distance will prove their worth for New England roads. All entries must be filed with Chester I. Campbell, manager, 5 Park Square, Boston, Mass.

Annual committee appointments for the Worcester Automobile Club, just announced, are as follows:

Executive Committee for Dead Horse Hill climb—President John P. Coughlin, chairman; C. L. Chamberlain, Daniel P. Gay, G. D. Webb, and George E. Stimpson. Commissioner W. E. Hassan, George D. Webb, and W. C. Watson figure as a special committee to prepare the road for the climb.

Membership—D. P. Gay, G. E. Stimpson, G. E. Ryan.

Laws and Ordinances—D. F. Gay, F. C. Smith, Jr., J. P. Coughlin.

Highways—W. E. Hassam, George Maguire, A. W. McGill.

Runs and Tours—M. P. Whittall, Hon. F. A. Harrington, D. C. Sargent.

William N. Stark has been appointed chairman of the House Committee, and he will appoint his confrères.

The Automobile Club of the Princetonians.

PRINCETON, N. J., May 7.—Sixteen cars belonging to members of the Princeton University Automobile Club had an official run to the Pennsylvania-Princeton baseball game in Philadelphia last Saturday. Seventy Tigers were carried in the cars. The result of the ball game made the return trip particularly enjoyable to the Princetonians.

Milwaukee Automobile Club Will Have Quarters.

MILWAUKEE, WIS., May 7.—At a meeting of the Milwaukee Automobile Club held at the Hotel Pfister plans for the selection of club headquarters were favorably acted upon. The advisability of either securing rooms or building a small clubhouse has been discussed pro and con for the past two years, but at no time has the disposition to take definite action been so strong as the present season, and the impetus given the project at the last meeting indicates that it will be carried to completion. It is proposed to obtain quarters similar to those of the Cleveland Automobile Club, which has its home in the Hollenden Hotel. A committee was appointed to make arrangements with one of the downtown hotels for a suite of rooms to be fitted up with billiard room, restaurant, reading room and any other convenience which the club might require. It is the intention of the club to secure permanent quarters where members may meet and where visiting automobilists may be entertained. Material of interest to autoists, including maps of drives in Wisconsin and throughout the country, will be one of the features of the reading room.

Another question which was taken up for discussion was the arrangement for a race meet to be held at the State Fair Park, entries for the various events being restricted to local machines and drivers. The program will include handicap races, and prizes will be hung up to stimulate interest. If the meet proves a success a series of similar events will be held during the season.

A committee of ten was appointed to take charge of the proposed Orphans' Day outing.

Canada Will Entertain American Tourists.

MONTREAL, QUE., May 7.—The Automobile Club of Canada will use its surplus funds to give prizes to landowners in the outlying municipalities for the best-kept sections of public road. The decision was reached at the annual meeting of the club held this week. To interest automobile owners in the club, the membership fee will be reduced from \$25 to \$10.

On the afternoon of May 12 the members of the club will have as their guests the members of the City Council, and heads of the various departments, and representatives of the press.

In the May 19 run the route will be by way of St. Annes and Cartierville, circling the upper portion of Montreal Island.

The officers of the club are now in communication with the A. A. A. Touring Committee, for while here the American tourists of course will be the guests of the local club.

The election of officers for the ensuing year resulted as follows: President, Duncan McDonald; vice-president, Dr. A. Mignault; secretary-treasurer, George A. McNamee; directors, F. H. Anson, Eugene Tarte, William Carruthers, A. J. Dawes, Clarence F. Smith and U. H. Dandurand; honorary members, Hon. L. J. Forget, Justice Robidoux, Hon. A. Turgeon and H. Beaugrand.

Annual Hill Climb at Cincinnati, May 19.

CINCINNATI, O.—The Automobile Club of Cincinnati has designated Saturday, May 19, as the date for the annual hill-climbing contest of the Queen City automobilists. A permit has been obtained from the chief of police for the use of the Paddock Hill road for that day, and the superintendent of street cleaning has promised to have the course in good condition for the big annual event. President Duttonhofer of the club is sending out blanks for entries and will announce the list of officers in a few days. It is expected this year's contest will exceed any former event in interest and attendance.

Cincinnati's streets and avenues, as well as the outlying roads, were probably never in as bad condition as at present. It is immaterial as to whose fault it is as long as the fact remains.

The superintendent of street cleaning and repairs says he has no money with which to work, and the reform administration does not seem able to meet the emergency. In the meantime all persons suffer from dirty streets and thousands of holes in the roadways, and of course the automobilists, who in another month will be paying double license, are getting the worst of it.

The Automobile Club of Cincinnati will remain a member of the American Automobile Association, and will prove an energetic member of the Ohio State Association of the national body.

Minneapolis Will Indulge in a Hill Climb.

MINNEAPOLIS, MINN., May 7.—On St. Anthony's parkway, May 15, the annual hill climb of the Minneapolis Automobile Club will be held. The parkway ascends the bluff along the river bank in such a way that the spectators are able to witness the entire contest. The cars will be classified according to price, and all professionals will be barred. No stripped cars will be allowed, but all must enter in full touring rig. The contest is also limited to members of the club, and it is expected that between fifty and seventy-five entrants will participate. Considerable rivalry exists between many owners, and many close finishes are promised.

Asa Paine, president of the Florida East Coast Automobile Association, returned to his home in Minneapolis last week, after having spent the winter in Florida.

At the last meeting of the directors of the Minneapolis Automobile Club, the lease for the clubrooms at the Plaza Hotel for one year was signed. The directors also authorized the house committee to secure estimates for the cost of properly furnishing and equipping a meeting-room, billiard-room and buffet, and submit them to the directors. The sum allowed for the purpose is between \$1,500 and \$2,000. About a dozen new members were admitted.

Three Pennsylvania Clubs Join State Federation.

PITTSBURGH, PA., May 7.—Three clubs identified themselves with the Pennsylvania Motor Federation during the past week, the list including the Automobile Club of Blair county, with headquarters at Altoona, a recently formed organization with thirty odd members, of which Dr. O. H. Shaffer is president and R. H. Fay, secretary; the Automobile Club of Central Pennsylvania, with headquarters at Milton, having a membership of over fifty, F. R. Slifer, secretary; and the Automobile Association of Center county, located at Bellefonte, of which Robt. F. Hunter is secretary. Eleven clubs are now affiliated with the Federation, which is taking an active interest in the project for improving the Philadelphia-Pittsburgh road.

New Jersey Booms Despite the New Law.

TRENTON, N. J., April 30.—Frank B. Moore, a prominent member of the Mercer County Automobile Club, has purchased a White touring car and many new machines are being received by Trentonians daily despite the new law. The road improvements in New Jersey are now in full progress, and the coming season is a very promising one for automobilists.

It will, perhaps, be of interest to tourists to know that the old Trenton House, which for ten years has had the popular Fred S. Katzenbach as proprietor, has changed hands, and that pleasing host will no more be seen by automobilists. Mr. Katzenbach is well known throughout the state and his popularity among auto tourists is extensive.

CLUB DOINGS IN GENERAL.

NEW YORK.—The members of the Automobile Club of Crescent Lodge, F. A. M., No. 402, of this city, made the annual banquet run to Blossom Heath Inn, Larchmont, last week, where the spread was laid. The officers who had charge of the outing and who were present are: President, Carl H. Page; vice-president, Alden J. McMurtrie; secretary, Roy G. Howell; treasurer, How-

ard M. Davis; marshal, James J. McKenna; directors, Conrad M. Pitcher, Leon Rubay, J. Caster Williams, Ralph T. Olcott, Richard L. Gibbs and Harry Unwin.

BROOKLYN.—Secretary Pierson, of the Long Island Automobile Club, announces the date set for Brooklyn's automobile parade as Saturday afternoon, May 19. Dr. William P. Richardson is chairman of the parade committee, and invites New York automobilists to take part in the procession, which will probably start from the Plaza, Brooklyn, and go through Prospect Park and down the Boulevard to Coney Island. A large passenger automobile will precede the procession with a band.

CHICAGO.—The Chicago Automobile Club has moved into its new temporary quarters, suite 60, Fisher building, corner Dearborn and Van Buren streets, owing to the expiration of the lease on the property it occupied at 243 Michigan avenue. The temporary quarters, which consist of a reception room, a directors' room and the secretary's office, will be used until the completion of the new clubhouse on Plymouth place.

MEMPHIS, TENN.—Automobilists of this city are actively engaged in the preliminary work of organizing a club. A committee, consisting of W. C. Johnson, G. T. Broadnax, and Joseph Stewart, has the matter in charge, and a permanent organization will be effected under the Memphis Automobile Club.

PACIFIC COAST BEACH COURSE.

LOS ANGELES, CAL., May 3.—California is to enter the beach racing game. A course, 16 miles in length, along the shore of the Pacific, has been laid out, and every effort is to be made next year to bring west the big cars which have been making the Florida beaches the center of the winter racing game during the past few years. El Pizmo Beach is the name of the new candidate for racing honors. It has a first-class hotel and miles and miles of hard sand. The course is 211 miles from Los Angeles and 275 miles from San Francisco.

The first tryout occurred last week. Two Pope-Toledos, belonging to Messrs. Lingley and Hazard; a Frayer-Miller, owned by Harry Howes; Thomas Wadsworth's Tourist, and a Maxwell Speedster driven by Clarence Smith left here on invitation of the beach people, and although several bad places were encountered as a result of recent landslides, the cars went through without mishap. Hazard's Pope-Toledo, with the full touring equipment, went a mile in 1:09, and Lingley's car reeled off a mile in 1:11. Those present at the tryout speak enthusiastically of the course and say it is possible to hold some great races there. If the co-operation of the California clubs can be obtained, something in the way of a meet may be pulled off this coming fall.

The Los Angeles-San Francisco endurance run scheduled for June has been called off on account of the recent earthquake.

TO MAKE GASOLINE ELECTRIC MERCEDES.

A contract has been concluded between the firms of Cannstatt Daimler and Jacob Lohner, of Vienna, to erect a factory at Vienna for the manufacture of Mercedes electromobiles on the Lohner-Porsche system. An output of 1,200 vehicles, intended principally for foreign trade, is expected in the first year of operation.

There are now in operation in Germany between 5,000 and 6,000 alcohol engines, and it is estimated that when alcohol designed for such purposes in the United States is free from Government tax a much larger number will be used here. Internal combustion engines using alcohol as a fuel are coming into general use on farms for running all kinds of farm machinery. It is used also in running light machinery in workshops.

ITALY'S NEWEST AUTOMOBILE.

Italian cars have been coming into prominence rapidly of late, and have shown their equality with the world's best productions in many contests in the last two years. The Zusta car, built in Milan and Intra by the *Fabbrica Italiana di Automobili*, is being brought to the attention of Americans through its importation and sale in the United States by R. Bertelli & Company, 124 East Nineteenth street, New York City. The first general public inspection of this make was afforded last January in the A. C. A. show in the Sixty-ninth Regiment Armory in New York, where a chassis of the 40-50-horsepower touring car was exhibited. A number of cars have been ordered since then, and at the present time one or two are arriving by steamer every week or so. Some of those who have driven the car assert that in ease of control, smooth running and speed it ranks with the foremost European productions.

A distinctive feature of the construction is the frame, which is pressed into form in one piece from a single sheet of steel. The cross frame members are integral with the bottom flanges of the side channels, and after the cross and side channels have been flanged up and over, the top flanges on both are connected by rivets, suitable projections being formed on them for this purpose. One of the cross members is dropped to support the front end of the gearcase, while the others are straight. Webs are formed in the angles at the junctions of the cross members with the side frames, and in certain other places pieces of pressed steel are riveted to the frame to give increased stiffness. A pressed steel dustpan extends from the cross member under the radiator at the front to the member that supports the transmission gearcase, entirely protecting the engine and operating mechanism from below. The hood is close fitting over the engine, and instead of a fan behind the radiator, a draft through the radiator and the engine space is induced by means of fan blades cast in the flywheel.

The engine, as shown in the photograph, has the cylinders cast in pairs, with integral water jackets. Inlet and exhaust valves are on the same and left side of the engine, mechanically operated by a single camshaft. The push rod guides are held in place by yokes, rendering them easily removable. In the 40-50-horsepower car the bore and stroke are each 5 inches. The pistons which, like the cylinders, are long, have convex heads corresponding to the dome shape of the cylinder heads. The water jackets are thin and extend less than half way down the

length of the cylinders. Strength and lightness are combined in the crankshaft and connecting rods by hand forging them from nickel steel, the shaft having the flywheel flange formed integral with it and being supported on three long bronze bearings, and the connecting rods being rectangular in cross section and having the weight distributed to accomplish the most good. The crank pins are hollow.

All valves, which are arranged side by side in pairs, are made very light from one piece of special nickel steel, and are interchangeable. They are closed by large and long valve springs. A single cast iron exhaust pipe extends rearwardly along the sides of the valve chambers and receives the discharges from all. Just below it is the Siamese inlet pipe from the carbureter. Heated air is drawn into the carbureter through a special pipe with an extension passing around the exhaust pipe.

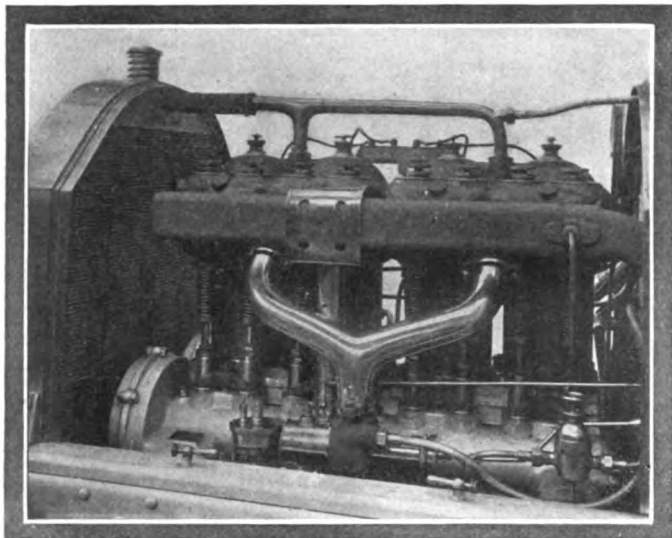
The carbureter is of the float-feed type, with sliding piston throttle, having an extension with opening of variable width that forms the auxiliary inlet and operates in conjunction with the piston throttle to give the widest opening when the main throttle is wide open. The gas mixture is delivered by the inlet pipes to bifurcated ports or connections between each pair of cylinders. Gasoline is fed to the carbureter under pressure from a thirty-gallon tank at the rear, the pressure being obtained from the exhaust.

Ignition is by means of a low-tension Simms-Borsch magneto and make-and-break mechanism on the right side of the engine, as seen clearly in one of the photographs. The magneto is direct driven by spur gear from the crankshaft, the gears being encased in aluminum boxes. The actuating rods for the hammers are operated by a camshaft in the crankcase, the cams having diagonal faces so that the spark can be advanced or retarded by shifting the shaft forward or back in its bearings. One wire from the magneto is grounded on the crankcase and another carries the current to a bus bar at the top of the engine, whence it is distributed to the four cylinders. On this bar are four switch buttons, by means of which any cylinder can be cut out for testing.

Lubrication is by a force-feed oiler driven by belt from the rear end of the ignition camshaft. Leads convey the oil to the separate cylinders far down on their sides and to the main bearings, whence the surplus flows into the crankcase to serve for splash. The lower half of the crankcase is divided into four compartments, each provided with a drain cock.



CHASSIS OF ZUSTA 40-50 HORSEPOWER TOURING CAR.

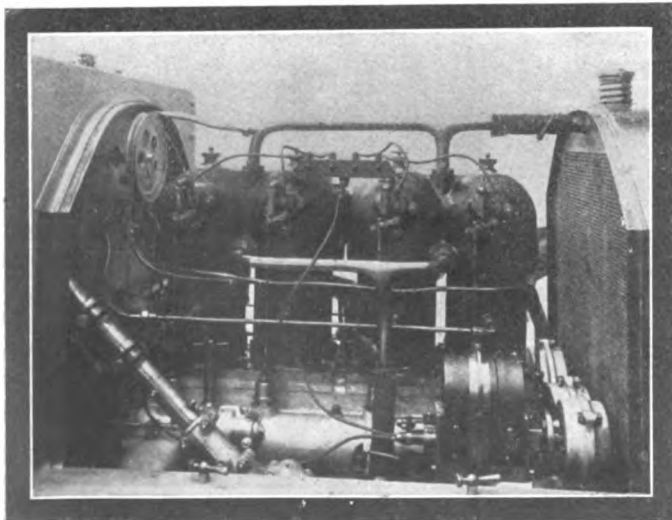


INLET AND EXHAUST VALVES ON SAME SIDE OF ZÜST MOTOR.

Cooling water from the base of the cellular radiator is forced through the jackets by a pump gear driven from the ignition camshaft. The connections are made flexible by means of sections of rubber hose, and wrenching of the cooler is prevented by supporting it only at the base.

The clutch is of the multiple-disk type, operating in the hub of the flywheel. The disks are of steel and have friction rings of thin steel that can be replaced when worn without removing the main plates. A removable piece in the shaft reaching from the clutch to the change-speed gearshaft permits the taking out of the clutch without disturbing the engine or transmission.

The transmission is of the selective type, but is peculiar in that each of the two longitudinal shafts of the gearbox has a bevel pinion at the rear end, and these mesh with bevel gears keyed on sleeves extending from the differential hubs, the gears being next to the sides of the gearcase. Four forward speeds are provided. A bevel gear differential is located in the middle of the countershaft inside the gearbox and between the two bevel driving gears. A constricting band brake is fitted on a large drum on the countershaft just to the left of the gearbox. Drive to the road wheels is by two 11-2-inch pitch roller chains. Internal expanding brakes on the drive wheels are all enclosed to protect them from dirt and water. Front and rear axles are of I-section forged steel. Wheelbase of the 40-50-horsepower car is 112 inches. Control is by two side levers operating gears and emergency brake, two long push forward pedals acting on clutch and transmission brake and throttle and spark levers.



RIGHT SIDE OF ZÜST ENGINE, SHOWING IGNITION SYSTEM.

A. A. A. WANTS SIGN BOARDS.

One of the crying needs of automobile touring is the erection of sign boards on all main highways, and this matter is one which just now is receiving the marked attention of the American Automobile Association. This fact was brought forward at the regular monthly meeting for May, held last Thursday at the Automobile Club of America clubrooms on Fifth avenue, New York City. A uniform sign board will be adopted and suggested to A. A. A. clubs, which generally are much interested in the plan. In New York state, Ohio, and Massachusetts, many sign boards are being placed, and the tourists of the coming summer will profit accordingly.

President John Farson presided at the session, the other directors present including S. L. Haynes, Automobile Club of Springfield; F. H. Elliott, Syracuse Automobile Club; D. H. Morris, Automobile Club of America; Windsor T. White, Cleveland Automobile Club; G. E. Farrington, Automobile Club of New Jersey; A. R. Pardington, Long Island Automobile Club; G. A. Post, North Jersey Automobile Club; A. G. Batchelder, New York Motor Club; and Secretary S. S. Gorham, Chicago Automobile Club.

The newly appointed law committee reported that it was engaged in securing copies of the recent automobile laws in all states, and subsequently a general measure combining the best features of all the bills would be drafted in time for the legislative sessions of next winter.

Hereafter individuals joining the A. A. A. will receive an association button, the retail price of which is \$1.

It was announced that the official touring book of the association would be issued within the next fortnight. It is to be known as "The Automobile Official A. A. A. Blue Book."

In future the monthly meeting will take place on Tuesday, the constitution having been amended in this regard.

A large number of individual applications for membership were favorably voted upon.

RULES AND ROUTES OF THE A. A. A. TOUR.

The two sub-committees of the touring committee of the American Automobile Association will report with promptness, if the wishes of Chairman Paul Deming are observed. The trio entrusted with the rules, consisting of L. E. Myers, F. B. Hower, and Secretary S. S. Gorham, have a difficult task in hand, but the offering of several cups in addition to the Glidden trophy may make their labors somewhat easier. It is probable that the large and small touring cars will be divided in some manner.

The committee on the route, consisting of Augustus Post, Judge James B. Dill, and F. B. Hower, is an excellent one, as both Judge Dill and Mr. Post have toured in Maine and Canada. The roads from Burlington, Vt., to Montreal, thence to Quebec, followed by the return to the United States through Maine to the conclusion at Bretton Woods in the White Mountains, are pronounced by Judge Dill to be uniformly good. After reaching Bretton Woods the tour practically disbands, and the tourists, with another contingent that will journey from New York and Boston to the White Mountains, will witness and participate in the climb of the Crawford Notch, which will take the place of the "Climb to the Clouds" up Mount Washington.

PERCY PIERCE SAILS FOR EUROPE.

Percy P. Pierce, of the Automobile Club of Buffalo, Saturday last sailed for Europe on the *Patricia*. He will go direct to Paris, and then to Germany to participate in the Herkomer cup race to be held during June. Subsequently the 1905 winner of the Glidden trophy will compete in the European circuit, the 3,000-mile tour that will cover half of Europe. The American will drive a regular Pierce Arrow stock touring car, and while he has no visions of first prize he anticipates making a good showing, despite the fact that he will be pitted against the best cars in Europe.

MONTREAL'S SHOW A SUCCESS.

MONTREAL, CANADA, May 7.—The International Automobile and Motor Show, which occupied the week of April 21 to 28 in the Arena Rink, was a success from start to finish, and the joint managers, D. H. Lewis, of Buffalo, and R. M. Jaffray, of Montreal, were the recipients of congratulations from all sides. Fully 20,000 people saw the different exhibits, and from the time the show opened till its close the Arena was packed with lovers of automobiles. Throughout the week business was noticeable, and lots of it. A great many cars were sold to people who had no



GENERAL VIEW OF THE SUCCESSFUL MONTREAL SHOW.

idea of purchasing one before visiting the show. The automobiles and accessories displayed were among the best productions of Europe, America, and Canada, and Montreal people appreciated the fact. The promoters were so well pleased with the result of the show that they secured an option on the Arena for 1907 and intend making it an annual exhibition.

The Canadian Motor Company, Montreal, showed the Cadillac, Oldsmobile, Darracq, and Knox truck; the Easton Automobile Company, Montreal, the Pope-Toledo, Russell, and Waverley Electric; Wilson & Co., Montreal, the Franklin, Buick, and Baker Electric; Henry Morgan & Co., Montreal, the Maxwell, Argyll, and Decauville; British and French Motor Car Company, Ltd., Toronto, the Panhard, De Dion-Bouton, Daimler, Argyll, Swift, and Minerva; Automobile Import Company, Montreal, Beeston-Humbers. Specimens of Dunlop, Fisk, Continental, Kelly, Springfield, and Samson leather tires were shown, also a fine line of English, French, and American accessories, and automobile clothing.

BOSTON'S MAYOR AN AUTOMOBILIST.

BOSTON, May 7.—Mayor John F. Fitzgerald, originator of the "Bigger, Busier, Better, Boston" campaign slogan, has become an automobilist and hereafter will conduct his strenuous administration of the city from the seat of a big six-cylinder, 50-60 horsepower National touring car, as well as from his office at City hall. The mayor's machine was delivered to him this week by J. M. Linscott, the local agent, and the mayor immediately had it registered, receiving from the Highway Commissioners the number 13,129. He did not take out an operator's license, and, for the present, at least, will rely on the services of a professional chauffeur. The mayor became acquainted with automobilism last fall during his whirlwind tour for the Democratic nomination, and later in the pre-election campaign. During the last few days just before the primaries, and again just before the election, he almost lived in the automobile, leaving it not even for meals and sleep. One night he covered every one of the twenty-five wards in the city, making a speech in each.

Besides using the car for traveling between his home in Dorchester and City hall, Mr. Fitzgerald will make use of it in his trips about the city, for which he is famous. With the automobile he will be able to visit the various departments and pieces

of work under way before the superintendents and foremen can be forewarned of his coming. His habit of dropping down unexpectedly in places where city work was in progress has caused some consternation among the city employees.

It is said that an episode which occurred during the winter had something to do with the mayor's determination to have an automobile. He had planned to take a vacation in Hot Springs, Virginia, and had engaged accommodations on the limited New York train. He was to meet Mrs. Fitzgerald at the station, she to come in a carriage from their home. The time for the train to start arrived, but no Mrs. Fitzgerald. The train was held two or three minutes, and then left without the mayor. An accommodation train was due to leave three minutes later, and this was held five minutes, during which Mrs. Fitzgerald put in an appearance. Her excuse for the delay was that the horse could not make quick enough time to the station.

FOURNIER ORDERS AN AMERICAN CAR.

The Rainier Company of New York is elated over the receipt of a telegram from Henry Fournier, ordering immediate shipment of a 35-horsepower Rainier car. The old adage, "carrying coals to Newcastle," becomes applicable to the situation in this instance, and marks a distinct epoch in the history of American automobile manufacture, when high-powered touring cars are being sent to France from America instead of the reverse condition, which has been hitherto prevalent. The selection of the Rainier as worthy of representation in his Paris salesrooms by M. Fournier is a source of much satisfaction to its maker.

HOW THE INDIAN FOUND THE SPOT.

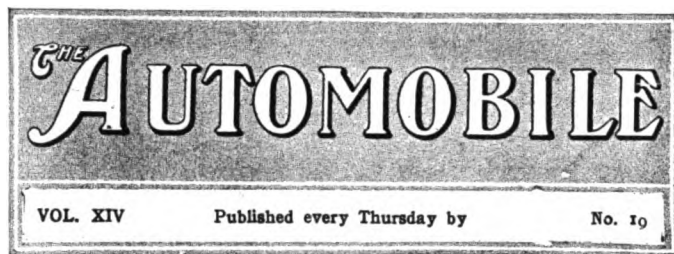
TACOMA, WASH., May 5.—By using an automobile it was possible for a committee from the Pierce County Pioneers to locate the exact spot upon which Captain Charles Wilkes celebrated July 4, 1841. This was the first patriotic celebration on the Pacific Coast, and the first arranged west of the Mississippi river, and took place on the north shore of Lake Sequelitchew, but a few hundred feet from American lake, and which was named by Captain Wilkes on the same day. The committee learned of the existence of Slugimas Koquilton, an aged Yakima Indian, about 85, and that he had been present. The Indian was located, and corroborated the story. Being aged and infirm, the auto was the



HOW THE OLD INDIAN WITH A RAMBLER FOUND THE SPOT.

only practical method of taking him out to the lake, which is about fifteen miles from here, and on the prairie road to Mount Tacoma. He located the exact spot.

The accompanying photograph is interesting in that it was taken on this historic spot, and containing as it does the only person living who participated in the affair. The old Indian occupies the seat with W. W. Wing of the American Automobile Company. In the rear seat are William Lane, an old Indian fighter, and W. H. Gilstrap, curator of the Ferry Museum.



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" " Since Jan. 1,	- - - - -	274,000

Surprises Marked the Two-Gallon Test. The two-gallon efficiency contest held by the Automobile Club of America furnished several surprises. The number of entries was greater than anticipated, the early promise of a beautiful day was unexpectedly broken by a tremendous downpour which made the going exceedingly difficult in the clay stretches of road, and the distances covered by a considerable number of the competing cars were surprisingly high. The American car has come out with high honors, and of the distinctively domestic type at that—the air-cooled car. Unless any final rearrangement of figures should change the result, the first place is held by the Franklin runabout, with a distance of 87 miles to its credit, and second place by the Frayer-Miller touring car, which with five passengers on board covered nearly 48 miles. Third place went to France, a medium-powered Darracq touring car covering 40+ miles with five passengers. Another surprise was the fine performance of the huge Mack observation wagon, which, with nineteen persons on board, covered a distance of between 17 and 18 miles. It was the only representative of the commercial vehicle type in the contest and its performance showed a low operative fuel cost from a transportation standpoint.

A pleasing feature of the contest was the presence of many amateurs, who entered and drove their own cars. In spite of a tremendous downpour in the afternoon, and the long delays between the times of stoppage of many cars and the arrival of the relief car, the contestants showed an undiminished interest in the contest and complaints were few. No doubt the experience gained in this contest will be availed of to better arrangements in the future. Some needed changes would appear to be: An

earlier closing of the entry list; an earlier start on the day of the contest; the assignment of observers to their cars before the old fuel supply is emptied out and the new measured quantity taken on, so that all the actions of the contestants that have a bearing on the final results may be under official observation; the employment of a greater number of relief committee cars to determine the location of cars after stopping and avoid unreasonable delays of contestants on the road.

Probably with the best of intentions the committee underestimated its task, and though it was originally announced that the award would be made on the day of the race, this was found impracticable, owing chiefly to the unexpectedly long distances covered by competing cars.

An Existing Need That Will Be Supplied. Touring is the core of automobiling, and to make this feature thoroughly enjoyable one must know where to go. A long-felt want—not so very long after all, when one realizes the short life that the automobile has lived—has been the need of an up-to-date tour book for the use of the army of automobilists who desire to see more of their own country, either for purposes of pleasure or business. It has been an intricate task to bring forth "The Automobile Official A. A. A. Blue Book," but the publication appealed so strongly to the American Automobile Association that the national organization gave its official indorsement to the comprehensive effort of the Class Journal Company. All available sources of information were sought in its preparation, and it is believed that it will prove of satisfying value to the touring automobilist. Of course, future editions will show decided improvement, and the scope of the book will be enlarged as the demands for it accrue. One must not only know where roads are, but he must also be informed as to the best route in the maze of highways. One also desires to know about hotels where he can comfortably repose, and learn concerning garages where patronage receives the right kind of attention. All these things are answered in "The Automobile Official A. A. A. Blue Book," which will come forth from the press in the next fortnight.

The Economy of Automobile Cars. Developments which indicate the widespread use on railroads of automobile cars are many, companies being incorporated in various parts of the country. The secretary of a concern recently organized in New York City sums up the reasons for the automobile railroad car in this manner: "Automobile cars can be operated for less than 25 per cent. of the cost of locomotive trains, making possible a frequency of service nearly four times that given under existing conditions without increasing expenditure. They can be run at high rates of speed, can be stopped at cross-roads, and handled similarly in every respect to a trolley car." It will be through the medium of the automobile railroad car that the railroad companies will be able to compete against the numerous automobile bus lines that some day will speed over specially built public highways.

The Utility of the Modern Automobile. A Wisconsin farmer wrote to an automobile agent in regard to the purchase of a machine wherein he stated a part of his wants in this manner: "I would like to know if you think it feasible and how I could use the automobile to grind grain, run saw, and husk and shred corn with it." The reply being of a reassuring sort, the agent informing the rural genius that the work could be done by an automobile, a sale was effected. The agent, Alfred W. Norris by name, told where one of the motors in his plant had broken down, and the difficulty was met by jacking up one of the largest automobiles in the place. A tire was removed from a rear wheel and the rim wound with rope to secure a flat surface on which a belt would work. By this means all machinery in the plant was operated for a week.

OUTLOOK GOOD FOR FREE ALCOHOL.

WASHINGTON, D. C., May 7.—The outlook for the Payne Free Alcohol bill in the Senate is somewhat brighter, several important things having transpired recently to clear the situation. Not the least of these was the concluding paragraph of the President's message to Congress, transmitting Commissioner Garfield's report on the Standard Oil investigation, when he said:

"Though not bearing upon the question of railroad rates, there are two measures, consideration of which is imperatively suggested by the submission of this report. The Standard Oil Company has, largely by unfair and unlawful methods, crushed out home competition. It is highly desirable that an element of competition should be introduced by the passage of some such law as that which has already passed the House, putting alcohol used in the arts and industries upon the free list.

It was learned at the Capitol that members of the House are planning to bring political pressure to bear upon Senators in behalf of the free alcohol measure. Anxious and alarmed over the apparent indisposition of the Senate to take any action with reference to the bill, the Republican congressional campaign committee is to be called into the struggle. Representatives are in many cases very anxious about the prospect of retaining their seats at the coming election, and express the belief that the best argument they can put forward in their own behalf is the fact that they had helped in securing the passage of the alcohol bill.

The Senate Finance Committee, which has the Alcohol bill in charge, gave a hearing Saturday to Commissioner of Internal Revenue Yerkes, who discussed the denatured alcohol bill at some length. He explained the rules and regulations of other countries which provide for free alcohol, and assured the committee that after the spirits have been treated with denaturizing materials it would be infinitely more expensive and easier to detect a restoration for drinking purposes than to conduct an illicit still. Additional testimony on this point was given by C. A. Compton, a government chemist. He explained the difficulty in removing the denaturizing element, and said that little fear need be entertained on the score that free alcohol may be used in the preparation of intoxicating liquors. The committee will next hear the wood alcohol people.

PARIS AUTOMOBILE STRIKE NOW GENERAL.

NEW YORK, May 8.—The *Herald's* European edition publishes the following: The strike in the automobile constructing and coach building industries may now be considered general in Paris and the district. A few firms having special contracts with their workmen still continue to turn out machines, but they are so few that they may be said hardly to affect the general situation.

Viewed broadly, the automobile production is at a standstill, and people waiting for machines must make up their minds to some delay. Some authorities maintain that the strike is bound to terminate in a few days and others that a month must elapse before all is in swing again.

The position at the C. G. V. works, as explained by one of the directors, may be taken as an example of the position of affairs right through. On May 2 the men left work after completing eight hours, and on the following morning, on arriving, they discovered a notice placarded on the doors by order of the management dismissing the entire staff. On May 5 the men came to ask for their wages, but the management refused to pay and requested the men to sue for them.

The result is that until an agreement is reached as to this payment, apart from any fresh conditions which may be arrived at, it is improbable that the staff will be taken on again.

The Shah of Persia has ordered several pairs of motor-skates, a command which has set the ministerial world atrembling, as the government officials will most likely have to undergo tortures with them to amuse their ruler.

THE GRAND PRIX OF FRANCE.

PARIS, May 1.—For exactly a month the Sporting Commission of the Automobile Club of France has not had a single entry to register for its great race next June. It began to be asked what was the matter with the constructors, that they delayed engaging their machines, which everybody knew were being built specially for the great event. Four days before the official closing, the Renault team was registered, and the same day the Gobron, which had been looked upon as a doubtful starter, sent in the \$1,000 registration fee, together with the name of Rigolly as driver. The next day the first foreign team was received—three Fiat cars, to be driven by Lancia, Nazzaro, and another yet to be chosen. Vulpès, a French firm, having won glory in touring contests, next came along with its first big racer, and the public is now waiting for the final scramble of the two closing days, after which double fees will have to be paid.

On the closing of the American mail the list stood as follows:

Darracq—Hemery, Wagner, Hanriot, drivers.

Panhard & Levassors—Heath, Terte, Tart.

Brasiers—Baras, Lebrun, Barillier.

Lorraine Dietrichs—Gabriel, Rougier, Duray.

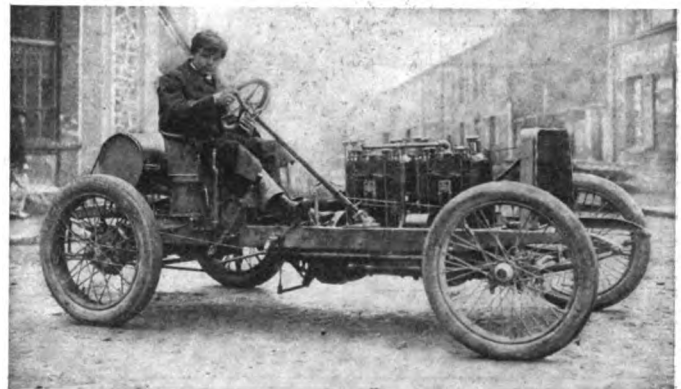
Gobron—Rigolly.

Renaults—Sisz, Edmond, Richez.

Fiats—Lancia, Nazzaro, third driver unnamed.

Vulpès—Barriaux.

The Sporting Commission has issued a notice that the Sarthe circuit is now closed to all racing machines, and will not be



THE 1906 RACING DARRACQ—HEMERY ACTUALLY SMILES.

opened again until a few days before the race. This step has been rendered necessary in order to facilitate the work of preparing the course, and tarring and oiling the surface. It will in no way inconvenience the native drivers, all of whom have thoroughly studied the course on either this year's or last year's racers. Foreign drivers will have to be content to make their acquaintance with the circuit on touring machines, practising with the racers during the last few days.

CAGNO AND AN ITALIA WIN TARGA TROPHY.

PALERMO, May 4.—Cagno, driving an Italia, to-day was the winner of the race for the Targa trophy, donated by Signor Florio. The 450 kilometers (about 281 1-4 miles) were covered in nine hours and twenty-two minutes. Four thousand soldiers kept the course clear and more than one hundred thousand persons witnessed the race.

GERMAN ARMY'S NEW ARMORED CAR.

Amid the preservation of great secrecy tests have been made with a new armored motor car in Germany, the Prussian war office being principally concerned therein. The car, the design of which is kept secret, was built in the Mercedes works, near Cannstatt; it will carry several guns.

MOTOR AND ACCESSORY MAKERS.

A total of 135 active members, reinforced by a flourishing treasury, was represented at the meeting of the Board of Directors of the Motor and Accessory Manufacturers, held at the Lafayette Hotel, Buffalo, May 1. The following firms were elected to membership: Cook Railway Appliance Co., Kalamazoo, Mich.; M. Strauss & Sons, Newark, N. J.; Noera Mfg. Co., Waterbury, Conn.; Syracuse Aluminum & Bronze Co., Syracuse, N. Y.; Consolidated Rubber Tire Co., New York.

President D. J. Post reported that the Permanent Show Conference Committee was already working on arrangements for coming exhibitions with a view to promoting the interests of the association. It was decided at the meeting to take a mail vote of the entire membership on the place of holding the next semi-annual meeting, the choice to be between Niagara Falls, Thousand Islands, Atlantic City, Manhattan Beach, and Saratoga. Strong evidence of increasing interest was shown at the meeting.

ONE OF WELLMAN'S MOTOR TRACTORS.

WASHINGTON, D. C., May 7.—A great deal of interest has been manifested in Walter Wellman's forthcoming search for the North Pole. An Indian motorcycle, built on original lines, which



AMERICAN MOTOR SLED FOR WELLMAN POLAR EXPEDITION.

will be a part of his equipment, was rebuilt in the shops of Chas. E. Miller & Bro., Washington agents for Indian motorcycles and Ford automobiles, and great things are expected of it. A great deal of study has been given the idea by George W. Wells, who has charge of Mr. Miller's machine shop.

As will be seen from the illustration, the machine takes the form of a motorcycle sled. The runners in front are constructed of steel tubing of small size and well braced. The framework of the original machine remains intact, in addition to which there has been added a pair of hickory runners. By means of a steel brace these runners can be elevated from the ground when the snow becomes too deep for the rear wheel to revolve. A steel-studded tire is used and the rim is reinforced by a rim of galvanized iron, with 2-inch corrugations every 4 inches. The motor is 2 1-4 horsepower, of the regular Indian type. The weight of the machine is about 200 pounds, and unless all calculations fail it will play a very important part in this latest Arctic expedition.

The machine has been shipped to the base of supplies Wellman has established in Norway.

OHIO'S LAW MAY BE INVALID.

COLUMBUS, O., May 7.—Ohio's new automobile law is no good, according to an opinion of Attorney-General Wade Hampton Ellis to Hon. Lewis C. Laylin, secretary of state, who is charged with its enforcement. He advises that no attempt be made to enforce the law until it shall have been held to be valid by the courts. A suit to test its constitutionality will be brought. He is of the belief that its provisions violate the State constitution, and were it not lame in this respect, he declares other numerous infirmities would be sufficient to render it inoperative. It is so loosely drawn that the State is left without means of enforcing the penalty against anyone violating its several provisions. The intention was to follow the New York law in drafting the measure, and sections of the former were inserted in the wrong place, added to which were ambiguities which practically nullify the law. So Ohio may have to worry along until the meeting of the Legislature two years hence without a State license law for automobiles.

The trouble starts in section 2, providing: "Every person hereafter acquiring a motor vehicle, shall, for each such vehicle, file in the office of the secretary of state a statement of his name and address," etc., which, interpreted literally, means that only those purchasing automobiles after the law is in effect are subject to it. All who buy before that time are not caught by the law, according to the faulty wording. Whether the courts would construe the law to mean this is, of course, a question. Another clause seems to say that a man who does not register his machine may run it without a license or payment for a year. Then it will be time to pay again, and if he doesn't he can't be touched for another year, and so on to infinity. The provision imposing a fee of \$3 for every additional 10 horsepower over 30 horsepower is inserted in such a bungling way as to indicate that the secretary of state, in forwarding record books of auto licenses issued to the county auditors, shall send \$3 with the same. The secretary of state is also required to pay the cost of putting the law into operation out of a fund which does not exist, and if it did, one that has not been appropriated to his use.

SCORCHERS TAKE UNFAIR ADVANTAGE.

CLEVELAND, May 7.—Automobilists have been giving the Cleveland police lots of trouble of late. Immediately after the passage of the Sawicki State automobile law, which supersedes all local ordinances, the Cleveland city authorities discontinued the issuing of license tags and issued orders that new operators should not be molested by the police if they did not carry number tags. It appears that a few would-be racers have taken advantage of this leniency and have taken their numbers off their cars, and are playing havoc with the speed ordinances, immune from arrest from the fact that the police have no means of knowing whether they are old or new operators. The other day a park policeman, who had been abused by a particularly obnoxious scorching, retaliated by firing his revolver after the flying machine in the hope of hitting a tire, thus causing the driver to stop. It may be that the policeman was only trying to scare the driver and did not fire directly at him, but the incident has caused a storm of protest from automobilists and the public in general.

The Cleveland Automobile Club took up the matter, and Secretary Goddard called on the chief of police and in the name of the organization demanded that orders be issued prohibiting such extreme measures. He pledged the word of the club that its members would take all measures to discourage scorching, and if possible would disclose the names of offenders to the police. He also said that if any of the members were guilty of the offense, the organization would take especial interest in seeing them prosecuted.

An irrepressible theatrical press agent has conceived the idea of holding an automobile show in the lobby of a Chicago theatre on the occasion of the presentation of a play which has for its central feature an automobile race.



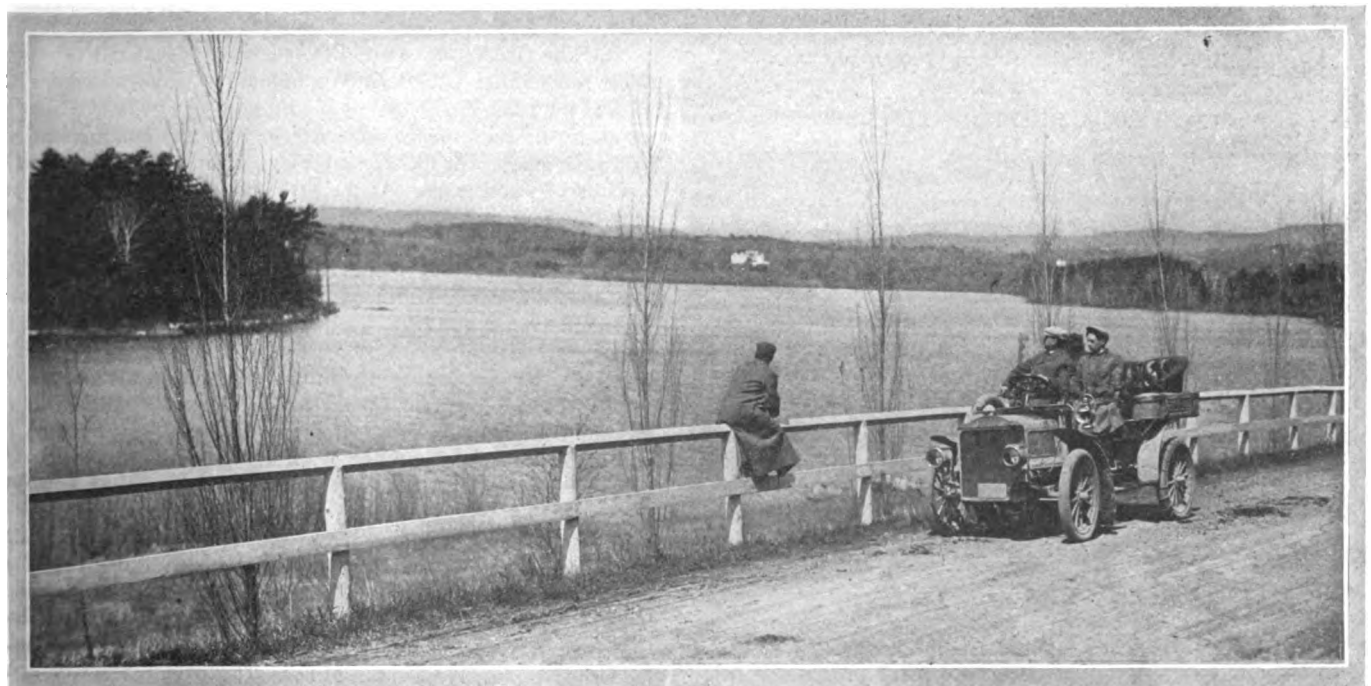
ON THE GOOD ROAD THAT LED OUT OF ALBANY—THE STATE CAPITOL IN THE DISTANCE.

A FRENCHMAN must be forgiven if he is fastidious in the matter of roads, for his country is celebrated in this respect above all others. I have journeyed in an automobile from New York to Albany, and the highway in the main is excellent. I have also toured from New York City to Springfield, and I must again repeat my good opinion of the road.

But the portion of the route selected for the June Economy Run of the New York Motor Club which lies between Albany and Springfield was unexplored country for me, and therefore I seized with avidity the opportunity of doing this trip with Harry Unwin, chairman of the Contest Committee, in a White steamer. The Albany-Springfield section figures as the second day of the economy run, and this picturesque Berkshire country proved enjoyable in the extreme for one who has covered a good many of the scenic parts of Europe. I said that it was most enjoyable,

but I should have qualified the statement that such would have been the case had it not been for the terrible roads, which to me seemed nothing better than chaotic lines drawn across hills and through vales by some devilish hand.

Of course, it was true that we left Albany in the rain, and there had been more of it previous to our starting. But, Great Heavens! what horrible quagmires we encountered. Save for the State road, which lent its resting smoothness for two score of miles, we enjoyed the scenery most of the time after the fashion of those sailors passing alongside a beautiful island and trying to admire the shores while uncomfortably their boat rocked on a rough sea. One of us, enthusiastically pointing to an imposing mountain in the distance, would exclaim: "Oh, say, look at that!" And just at the second of his last word the right rear wheel would sink and disappear in the nameless mud! And, always



NEAR LENOX, MASS., THIS BEAUTIFUL LAKE CHARMINGLY FITS INTO THE PICTURESQUE SCENE.

admiring the great big mountains over yonder in the distance, every one of us would jump off, taking great care not to kick the blessed camera, and, amidst the most wonderful landscape in the world, we would together buttress our shoulders against the dirt-sprinkled tonneau. But never mind, the trip was interesting from start to finish.



A SIDE-HILL FARM IN NEW YORK STATE.

Now, for the benefit of the contestants, I am going to indicate as faithfully as possible the itinerary of our journey.

Thursday morning, 7.30 A.M.—We leave Albany via State street, then turn right into Broadway, and a mile and a half further we turn to the left and cross a drawbridge. There we give fifteen cents, the toll fee. On crossing the bridge we turn sharp to the right (there is a newsroom on the corner). We then go about a quarter of a mile, and then turn to the left in Columbia street. Here contestants should remember that they must not turn with the trolley, but keep straight ahead to East Greenbush. The road is awful. It has been raining the night previous, and it is going to rain "some more." The sky grows dark. All around us are laid harmonious vales, valleys, and plateaus, newly painted with that sweet green of Spring. Although Mr. Unwin is an adroit driver, our coats and faces receive disagreeable hunks of mud from time to time. Now it is raining. I thought it would.

Here is Schodack Center, a hamlet that contains an empty horseshoer shop. The autometer accuses us of 103.4 miles. At the top of a hill on the left we pass a large white house with a cupola, probably built in the colonial days. There we turn to the right (remember this), and a pump marks the intersection of the fork. Then we continue straight ahead to North Chatham.



BETWEEN LENOX AND PITTSFIELD—HOTEL ASPINWALL.

If you are not in a hurry, before we reach Valatie, let me tell you what Mr. Unwin did at North Chatham. Mr. Unwin, our amiable host and driver, has been doing a little thing which, *entre nous*, has nothing to do at all with the economy test of the N. Y. M. C. Without asking permission he jumped from the car

and implanted a kiss on the fresh, purple, pearl-setted mouth of a sweet little brunette of sixteen, for the simple reason that the pretty lass brought us two heavy pails of water, for the machine. When this little act was performed, the girl—who possibly had never been kissed before—asked me, with an angelic smile, "If the gentlemen wanted anything else." But before I could have said "You bet," the steamer was off at top speed.

Now, Valatie. On leaving the village we climb a long hill and turn to the left—20 miles. Here we turn sharp to the right and pass a wide river over two covered bridges—23 miles. Here I shall not make any facetious remark about increasing the speed. The figures speak for themselves, and the drivers, consequently, know what they have to do. At that mileage a big red barn stands on the roadside opposite a large white house. Turn to the left. Half a mile further up we meet a fork near an unpainted church. We again take to the left, and then the road leads directly to Chatham. At the end of the town is a fork near a big hotel, the Windsor; we take to the right, pass the tracks a couple of hundred feet further on, and then turn to the left. Then the road leads directly to the State Line—301.2 miles.

Here the automobilist will travel in a splendid country, very fertile and cultivated. Little streams, bordered with willows and poplars, peaceful valleys, and great, bold hills in the distance, are parts of the picture. Alongside the railway tracks we find the monument marking the State Line, dividing New York and



POST IN FRONT OF HOTEL SEPARATES TWO STATES.

Massachusetts. We take lunch there in a good old roadhouse, where the milk is delicious.

Now the enchanting scenery commences. The road leading to West Stockbridge is better. We follow the trolley tracks. Parallel to the road and joined by a soft slope of about five hundred yards, runs a high, rocky ridge strewn with tiny bouquets of pine and birch trees. On the left hand lays a flat country, relieved by a series of small lakes. At the 51st mile a bad double turn presents itself; it is a railroad bridge, under which we pass at low speed after two sharp angles. We follow the trolley again.

Great Barrington—52 miles. A delightful, clean, quiet little locality. We stop in front of the automobile station on a wide, asphalted avenue and take gasoline and water. The afternoon has been pretty warm, and I suggest that a cool glass of beer or something would not be harmful, but, with a sad smile, Mr. Unwin informs me that this is a "dry town." "What do you mean?" I said, "I don't understand." "Well," he replied, "you will understand in a minute; I am going to introduce you to a gentleman, here, over the way; simply tell him that you don't feel well, that's all."

Rather puzzled, I followed my companion. We enter a drug store. Mr. Unwin speaks in a low voice to an old bearded pharmacist wearing spectacles. This apothecary looks at me and I look to the floor in an uneasy way. Then he makes Mr. Unwin sign a prescription blank; I look over his shoulder. The name he writes is "C. W. Smith, M.D." The druggist looks at me again, rather suspiciously this time, and five minutes later we are

in possession of half a pint of ordinary Scotch whiskey. This and the kissing business of the morning I will remember for a good long time.

We leave the town and again follow the trolley tracks—59 miles. We turn to the right and cross the Housatonic river—61 miles, and enter Glendale. From there a wide avenue leads us to Stockbridge. I do not know of anything more charming than this part of Massachusetts. We must be at a high altitude. Dusk comes slowly. On our right, in the distance, the glimmering landscape, limited by rocky chains, fades to our sight; but near us is a green lawn on which stand lofty cedars and oaks, assuming in the soft evening light a pensive attitude. There are no villages nor towns now, but artistic cottages, each in its own park.

The Red Lion Inn, in which we stop over night, is an old-fashioned hostelry, exceedingly clean and spacious. It was a very restful night for us, and the excellent breakfast we had in the early morning will also stand as a part of our recollections.

Friday, May 4, was a beautiful day, and over the grand scenery a glorious sun spread its warm smiles from dawn to dusk. On leaving Stockbridge via Main street, we meet a triple fork at the end of the town—mileage, 64 miles. We take the middle road, leave an Indian monument on our left, then the road turns to the right and continues to Lenox—69 1-2 miles, Curtis Hotel. We turn to the right and continue uphill, passing a white church and the Hotel Aspinwall. The seven miles separating Lenox from Pittsfield pass like a dream. Here the highway runs on the mountain flank, and the charmed eyes of the traveler can contemplate, diluted in the blue morning, the faraway rocky domes of the Berkshires, down to their feet; a tranquil, silvery stream; two or three glittering lakes, and, on every plateau, a millionaire's white cottage delicately set between the soft green of the valley and the tender azure of the skies. The road descends to Pittsfield—76 1-2 miles. In Pittsfield, to reach the Central Auto Station, motorists must continue down Main street, two blocks beyond the Square, to Tenner street, then turn to the right, go one block, and then turn to the left.

We return by the same road to Lenox—83 1-2 miles. At Hotel Curtis, we turn to the left and continue ahead—87 miles. At the foot of the hill we cross a bridge, on our way to Lee. The road is as picturesque as ever. Now East Lee—90 1-4 miles. The road here is perfect. We pass the shores of a beautiful lake, bordered by a white fence, and right after go uphill amidst the wildest nature. We find ourselves on the top of a high mountain. The spot is very windy; all around us lie distant valleys and villages. The tiny Westfield river jumps among its boulders. Two or three high peaks, miles away, point to the sky. I ask Mr. Unwin to stop a few minutes and let me contemplate at leisure the panorama, which reminds me of the great Klondike.

We shoot down hill on a very rutty and narrow stretch of road and reach West Becket—96 miles. At the fork, in front of the postoffice, we turn to the left and again start climbing a considerable grade. At the 97th mile we meet a fork, turn to the left, and continue to ascend. At the top of the hill we pass on the left an old wooden shack blown down by the wind; then we descend a steep slope, at the foot of which we find the Westfield river, already a little larger here.

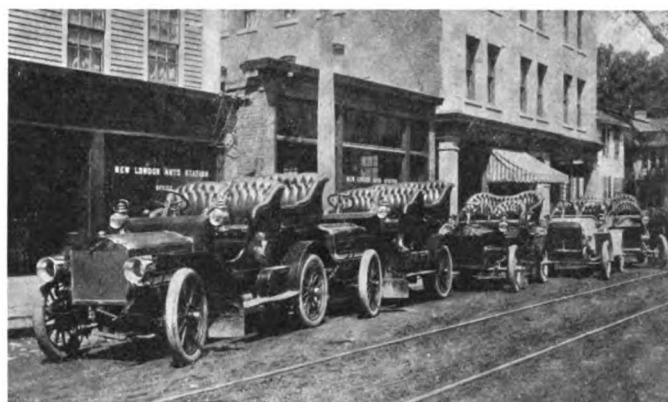
Chester—105 miles. From here to Springfield, end of our journey, the road stands in a fair condition. Immediately after leaving the town, we turn to the left on a railroad bridge. We are from now on entirely surrounded by mighty hills, shaded with all the tones of spring. The Westfield river widens. Woronoco. There is a big paper mill with an enormous flume carrying water over a distance of half a mile. For fifteen miles the trip is delightful along the picturesque creek, the air balmy and invigorating. We keep a very good gait.

Westfield—124 miles. Before a big tree in the center of the town we turn to the right, and then, following the trolley tracks, we reach Springfield, after having covered a distance of 124 miles.

The conclusion of my two days' experience in that part of Massachusetts is that America should be the first and only country in the world for automobiling, if she only had good roads.

NEW LONDON HAS NEW GARAGE.

NEW LONDON, CONN., May 7.—After a long time waiting to see whether the automobile was a fixture or merely a passing public fancy that would soon die out, New London has evidently come to the conclusion that the motor vehicle has come to stay, and a man has settled in town who possessed the hardihood to build a modern garage. Stables only have until now been available for the storing of automobiles by tourists stopping in this city, but hereafter the traveler may feel comforted in the knowledge that his wants will be well looked after in New



NEW GARAGE OF C. K. SMITH AT NEW LONDON

London. C. K. Smith, who has established the innovation, came here from Hartford, had the garage built, and after a few months' experience, is so well pleased with his reception by local and other automobilists, that he will enlarge the building in time to give better facilities another season. The garage is on Main street, the direct route east and west through New London for tourists covering the Long Island Sound shore route from New York to Boston. It has all the modern accessories and is well stocked with cars, available for the occasional automobilist, and on sale.

AUTOMOBILE FREIGHT LINE IN WISCONSIN.

MILWAUKEE, May 7.—An automobile freight line will soon be put in operation between Appleton and Neenah, two northern

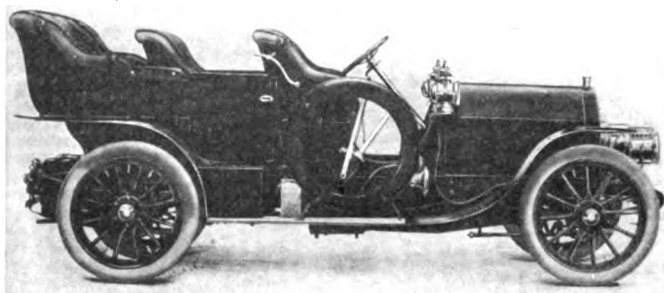


INTERIOR VIEW OF NEW LONDON GARAGE.

Wisconsin cities, by the Wheeler Transfer Company. The service will be conducted like that now operated between Menasha and Neenah by the Wisconsin Auto Transit Company. In addition to these companies which have already been formed, there are several others in an embryo state which will compete with the interurban electric lines in this quarter of the state. Several of the lines carry freight and passengers, but the proposed line between Appleton and Neenah will be for freight purposes only.

HEAVY TRADE ROUNDABOUT TACOMA.

TACOMA, WASH., May 3.—The automobile business can now be said to be humming here. The three firms have all they can attend to, and cannot secure cars fast enough to fill orders. Con-



NEW STEARNS "PULLMAN" MODEL WITH EXTRA BUCKET SEATS.

siderable business with the smaller towns of the state is done through houses here. Two firms have sold cars to Centralia, and one of them has placed orders in Nort Yakima, which is east of the Cascade Mountains. The cars in Centralia, 65 miles away, were driven down from here by the new owners. Richard Vaeth, who has not yet decided what his new car will be, this week took out a permit for the erection of a private garage, to be of concrete and steel, and cost \$1,000.

As an increase to the business here is the great interest manifested in the prairie roads, leading to Mount Tacoma. These roads are now in the best of condition, and every Sunday the automobiles do not give the dust time to settle. The Tacoma Country Club, which has its rendezvous on American Lake, is one of the favored spots, and nearly all the members own cars.

Chester Thorne, a prominent banker of this city, had his new Pope-Toledo confiscated in San Francisco during the earthquake. He had been touring southern California, and only the Saturday before the earthquake arrived in San Francisco.

HUSTLING CHICAGO'S TRADE ACTIVITIES.

CHICAGO, May 7.—The Chicago Automobile Dealers' Association's attorney, William A. Jennings, has filed a bill in the Cook County Superior Court against the city, for the purpose of enjoining the city from enforcing the ordinances passed in 1904 to



GENERAL CUTTING IN FIRST FOUR-CYLINDER OLDS IN NEW YORK.

regulate the speed of automobiles, to force the owners of machines to take out licenses, and to display numbers on the cars. According to the association, these ordinances are unfair and are

of the nature termed class legislation. The ordinances strike at automobiles and automobilists in particular, and exempt owners of other kinds of vehicles.

The Apperson Brothers' branch store will move from its old quarters on Wabash avenue to 1240 Michigan avenue, "Automobile Row," this month.

George Arbuckle, who has recently returned from Mexico, is now in charge of the local Winton branch. H. L. Owesney, who has lately been in charge of the branch, has been appointed a general supervisor. His headquarters will be at Cleveland.

C. P. Warner & Co., of 1218-1220 Michigan avenue, will handle the Crawford in several of the Western States.

The Central Garage, of which H. C. Griffin is manager, has moved to Jackson boulevard and Market street. The building which it now occupies was formerly the Parmelee barns and has accommodation for at least 200 cars.

STATISTICS THAT TELL A STORY OF PROGRESS.

WASHINGTON, D. C., May 7.—The Director of the Census has announced the result of the tabulation of the statistics of automobiles for the calendar year 1904, forming a part of the census



KING EDWARD'S NEW ENGLISH DAIMLER FITTED WITH SPECIAL BODY

of manufacturers of 1905. The figures indicate that there has been a very large increase in the industry of automobile manufacturing in the United States as compared with the statistics of 1900, which covered the fiscal year ending May 31, 21,386 passenger and pleasure cars having been produced in 1904, as against 3,316 in 1900, and 1,441 cars of other styles in 1904, as against 407 in 1900.

The number of establishments in 1904 was 121, exclusive of 47 establishments making automobiles, but engaged primarily in the manufacture of other products. The value of automobiles turned out by such establishments was \$879,205. The number in 1900 was 57. The percentage of increase in 1904 over 1900 was 112.3 per cent.

The capital invested in 1904 was \$20,555,247, as compared with \$5,768,857 in 1900, or an increase of 256.3 per cent.

Wage earners numbered 10,239 in 1904 and 2,242 in 1900, while the wages paid was \$6,178,950 and \$1,320,658, respectively. The percentage of increase was 367.9 per cent.

The cost of materials used was \$11,658,138 in 1904 and \$1,804,287 in 1900, an increase of 546.1 per cent.

The value of the product, including amount received for custom work and repairing, and value of products other than automobiles, was \$26,645,064 in 1904 and \$4,748,011 in 1900, an increase of 461.2 per cent.

A TYPICAL AMERICAN 60-HORSEPOWER CAR

THIS week, the first of the new 60-horsepower cars was put into operation by the testing department of the Stamford, Conn., factory of the Lozier Motor Company. The general characteristics of the Lozier are preserved in the new production, the first of which is its large size and high clearance. In appearance the chassis is striking in the impression it conveys of strength, an impression which is further enhanced when the motor itself is critically examined. It is a gracefully designed, powerful-looking car. Much aluminum enters into the construction of the underbody section, and the way it is cross-webbed gives it a solid appearance, irrespective of its proportionate light weight. All these castings are made at the Plattsburgh, N. Y., plant, where they are treated by special processes.

An examination of the working parts in partial detail shows the motor to be of the four-cylinder vertical type, with aluminum base supported by webbed cross members of the same metal cast integral with the base. The bore is $5\frac{1}{2}$ inches and stroke 6 inches. The crankshaft is machined from steel ingot, with bearings case-hardened and afterwards ground true to center by special Lozier machinery. A hard grade of phosphor bronze is used in the bearing boxes, into which babbitt metal is compounded in $\frac{1}{2}$ -inch sections in spiral form. The makers state that the case-hardened crankshaft bearings permit the use of the hard bronze in the boxes and the efficiency is thereby increased. The diameter of the front and rear journals is $2\frac{3}{8}$ inches, and that of the middle journal, $2\frac{1}{4}$ inches. Inlet and exhaust valves are located on opposite sides of the cylinders. They are made of nickel steel and mechanically operated by camshaft, which is lubricated by the splash system used in the engine base for lubrication of the crank bearings. Fiber gears mounted on brass skeleton to give them stiffness are used on camshaft.

Lubrication is by combined splash and force feed, independent pumps taking of the force-feed portion of the system. In the main crankshaft bearings there is a reservoir under each, fitted with spring and felt plug, which acts as a filter for the oil.

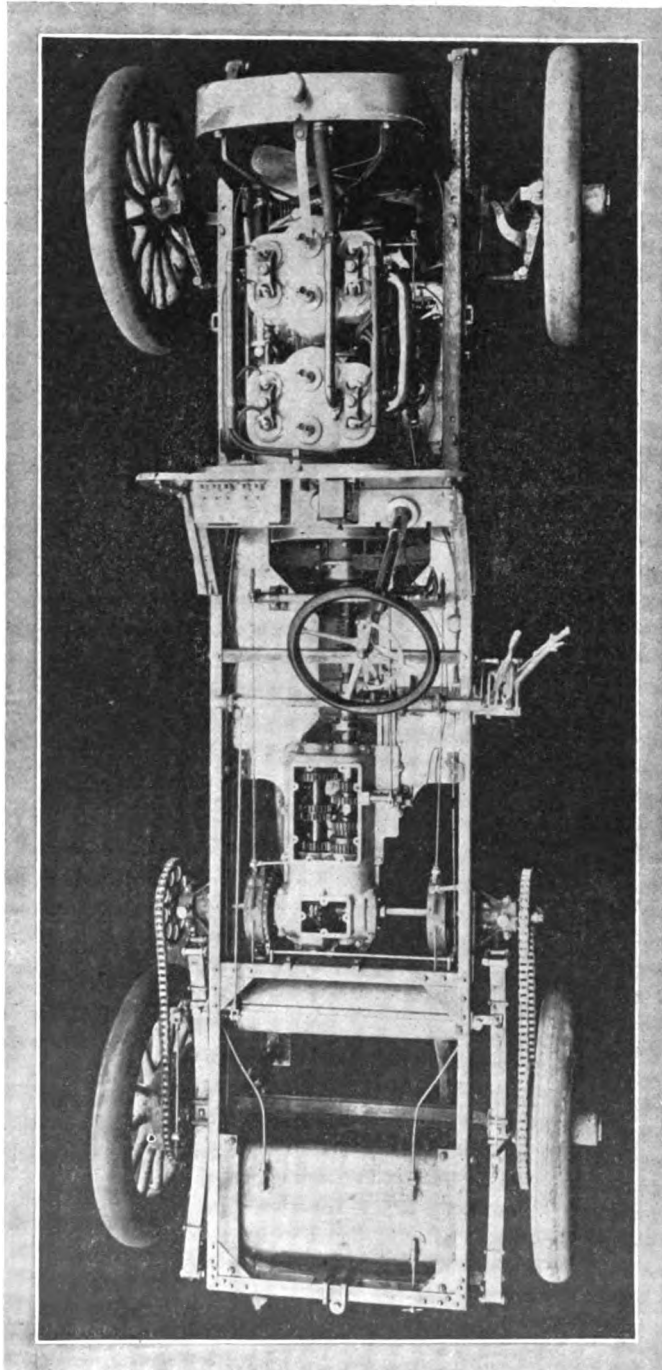
The motor is equipped with Scheubler carbureter, to which is attached a balanced throttle

of Lozier design. A ball-type governor on camshaft automatically controls this throttle, the tension of which is controlled by the operator from the steering wheel, who can set governor for any speed desired, and which, it is asserted, is automatically maintained on practically all grades.

A double ignition system is used, each independent of the other. A reference to the illustration will show the two separate sets of plugs in the tops of the cylinder, also the location of the magneto, immediately forward of the carbureter, in a location at side of frame, convenient to get at. The gasoline tank is situated at the rear of the chassis underbody and has a 12-inch clearance from the ground. It is of 30 gallons capacity and has exhaust pressure feed, with regulating valve.

Immediately connected to one of the cross members of the base of the crankcase is a reinforced aluminum case, inclosing the multiple-disk clutch, which in itself is interesting from the fact that it is composed of 56 disks. The disks are of saw steel. Attached to the aluminum case mentioned above is bolted another of the same metal, extending under the shaft and transmission case, making a continuous protection for motor and its working connections, from the forward part of its base to the jackshaft at rear of transmission. Under all these cases a strengthening rib extends longitudinally with the frame of chassis. Sliding-gear transmission of the selective type is used, four speeds ahead and reverse. The drive is the double chain type, with rear sprockets located directly over the inner ball bearings on rear wheels.

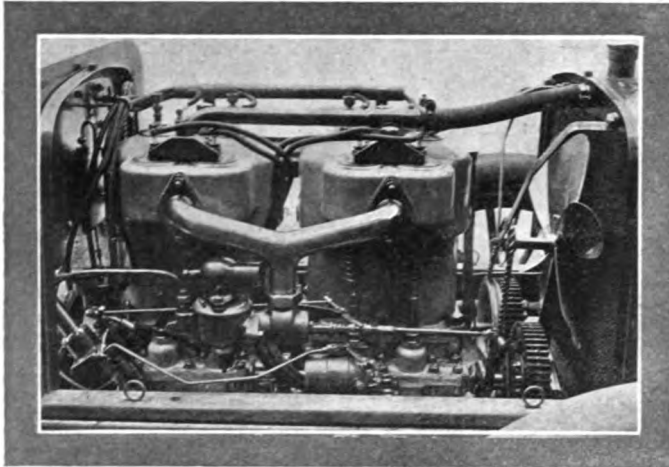
The double running brakes are of the contracting type, one on each side of the differential and equipped with equalizing springs. The internal expanding brakes are dust proof, and are also equipped with equalizing springs. The emergency brake is operated by a hand-lever pull toward the rear. This manipulation of the emergency is designed to give the operator greater purchase in applying the brake, as it allows bracing of the body with the feet. There is also a safety back-stop device, operating through a dog and ratchet on the differential brake drum. The dog is thrown into play by a small lever at side of the gear-shifting quad-



CHASSIS OF NEW 60-H.P. LOZIER TOURING CAR

rant. This prevents the car from backing down hill in case of failure of brakes to hold, and enables operator to start car on steep grade with all brakes free.

All axles are nickel steel, as is also the jackshaft. Three-point suspension springs support the chassis frame, which in itself is constructed of special steel 3-16 of an inch in thickness. At the



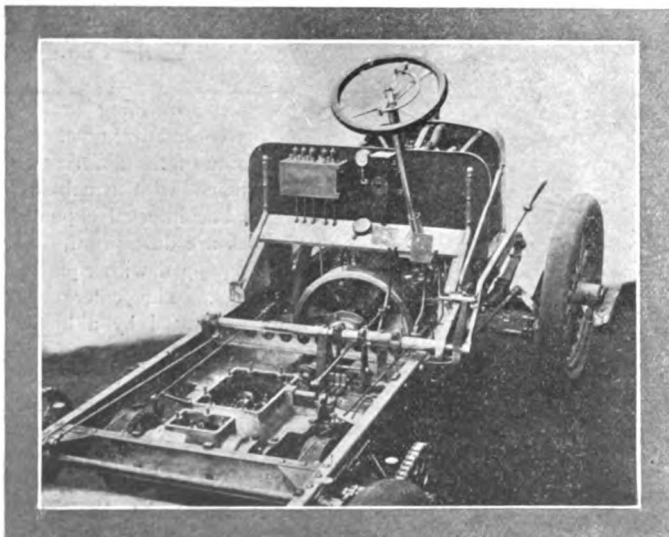
VIEW OF 60-H.P. LOZIER MOTOR, CARBURETER SIDE.

center of the car the frame has a vertical depth of 5 inches. No roller or plain bearings are used in the car, with the exception of those on the crankshaft. All others are ball bearings, nineteen sets being used.

Steering-column controls are stationary—they do not turn with the wheel—and worm and sector are irreversible. The cross link connecting the front wheels to the steering gear is placed at the rear of the front axle, out of the way of immediate danger in case of collision.

A REMARKABLE EUROPEAN RUN.

Charles Jarrott performed a remarkable feat on April 5 and 6, running his 40-horsepower Crossley car from London to Monte Carlo in 37 1-2 hours. He had arranged a schedule to do it in 48 hours, and even then it seemed a difficult thing to accomplish. Accompanied by the author, Mr. Filson-Young, and a mechanic, the intrepid driver left his London office at 7.45 A. M. on Thursday morning, caught the 11.45 boat at Folke-



LOZIER CHASSIS FROM REAR SHOWING MECHANISM.

stone and crossed over to Boulogne, where a fourth person was picked up. From there the route was by way of Abbeville, Beauvais, Dijon, Lyons, Avignon and Cannes to Monte Carlo.

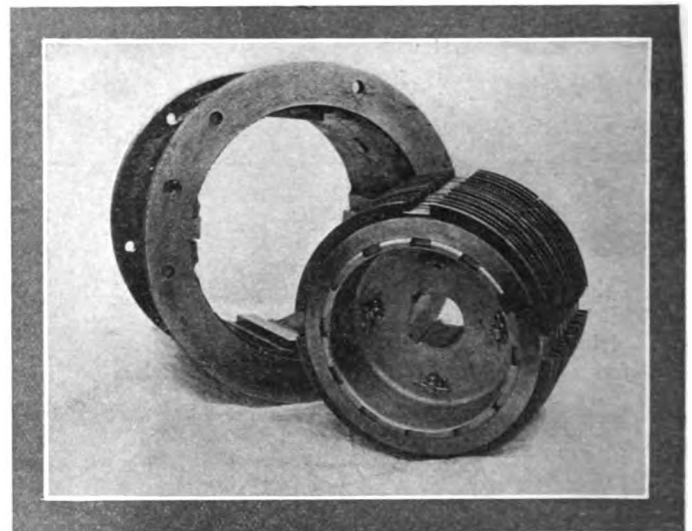
HALL PATENT CONCERNING ALUMINUM.

BUFFALO, N. Y., May 7.—Inasmuch as the automobile industry has been calling for large quantities of aluminum, much interest is being manifested by manufacturers in the expiration last April of the Charles M. Hall patent. This patent was granted to Mr. Hall on April 2, 1889, and under it the Pittsburg Reduction Company has found it possible to control the manufacture of the white metal in the United States up to this time. The importance of the Hall patent will best be understood when it is known that it protects the use of an electrolyte composed of cryolite as a solvent for bauxite, the raw material from which aluminum is made.

While it is understood that this electrolyte is now public property, the Pittsburg Reduction Company's method of operation is still protected by the famous Bradley patent, which will not expire until February 2, 1909. Others may seek to enter this field of industry, but the Pittsburg concern has not shown any fear of competition, for it has recently contracted for a large additional block of power from the Niagara Falls Hydraulic Power & Manufacturing Company.

SOME KANSAS CITY INVENTIONS.

KANSAS CITY, May 7.—Walter J. Paton, of Kansas City, has been granted a patent on a new tire for automobiles, which he says has shown up well under severe tests. The tire has an



LOZIER MULTIPLE 56-DISK CLUTCH.

iron rim bolted to the wheel in the form of a tube, with the outward part cut away sufficiently to permit the action of spiral springs fastened to the rim. Over this tube and firmly attached to the springs are twelve movable sections, playing loosely in slots on the solid rim, and also in slots at the end of the sections. As the wheel passes over the road, the section on the road is depressed by the weight of the vehicle, the springs giving the required resiliency. The tire is entirely of metal.

H. Holzmark, also of this city, has invented another resilient wheel, which takes the form of a small pneumatic ring, perhaps fourteen inches in diameter, that is interposed between the hub and the periphery of the wheel. It is held by short rods passing through it, so that the road shocks are taken up by this cushion instead of by the outside of the wheel. He has secured a patent on the device.

W. C. Brooks, a machinist in a local automobile shop, has patented a carbureter which he says shows a considerable fuel economy. He has had it attached to a number of cars here. The Smith Automobile Company, of Topeka, is fitting it to its cars this year and the Olds Motor Works is conducting tests with it. Briefly, the carbureter has three ports, with the throttle acting on two of them, so that, when running at low speed, only one port is open.

E. R. THOMAS DETROIT COMPANY.

Detroit has been selected as the location for the factory of a new corporation, which has been capitalized for \$300,000, and which will be known as the E. R. Thomas Detroit Company, for the manufacture of automobiles, which will be put out under the well-known Thomas name. The officers are: President, E. R. Thomas; first vice-president, H. E. Coffin; second vice-president, J. J. Brady; treasurer and general manager, R. D. Chapin; secretary, F. O. Bezner. A notable feature of the new company is the fact that E. R. Thomas, the well-known manufacturer of the Thomas flyer, is heavily interested in a financial way, and the entire output will be handled by the E. R. Thomas Motor Company of Buffalo for the season of 1907. Messrs. Coffin, Bezner, Brady and Chapin have been identified with the Olds Motor Works for several years and are thoroughly experienced in the details of a large manufacturing business. The type of car to be made will be announced later, but it will fit in well with the present Thomas flyer. It is designed by Mr. Coffin, who has made an excellent reputation as a clever young engineer.

A large factory has been secured in Detroit and the new company will begin operations at once. Contracts for some of the parts have already been placed, specifying early delivery, as the new line of machines will be ready for the market early in the fall. Temporary downtown offices have been established at 919, 920 and 921 Majestic Building, Detroit, and the business will be handled from there until the remodeling of the factory offices.

H. E. Coffin, the new company's first vice-president, built an automobile while yet at college, eight or ten years ago, and has been a close student of design ever since. The new two and four-cylinder Oldsmobiles are his latest product, and the success of these is ample evidence of his ability.

Secretary F. O. Bezner gained his first business experience with the National Cash Register Company, of Dayton, O., and has been purchasing agent for the Olds Motor Company for some time.

J. J. Brady, the second vice-president, was with the Olds Company for seven years, handling all their shipping and occupying the position of traffic manager.

Treasurer and General Manager R. D. Chapin was the first and only sales manager of the Olds Company up to the time of his resignation, March 1, of this year, and has covered the entire country and knows the automobile trade in every state in the Union. He is splendidly posted on the manufacture of automobiles, as he started in the shop, and has worked on them in every stage of construction.

NEW AUTOMOBILE CONCERNS.

TOLEDO, O., May 7.—Two new automobile factories with Toledo as their home is the record of the past week. The first of these is the Maumee Valley Automobile Company, which has been organized and taken a lease of the Kirk automobile and bicycle old plant on Oakwood avenue. The leaders in the enterprise are G. M. Verity, Middletown, Ohio, and F. W. Keating, formerly connected with the Pope Motor Car Company, of this city, but more recently with the Mississippi Valley Automobile Company, of St. Louis. The company will make only high-grade cars, the minimum price being between \$4,000 and \$5,000. It expects to get started in time to have its cars on the market for the season of 1907.

It Will Be Called the Maumee.

The Maumee Motor Car Works is the name of the other concern which will have its headquarters in this city. The plant of the company will be located at Dundee, Mich., and will consist of the establishment of the Wolverine Automobile Company. J. G. Swindeman, W. K. Terry, and Frank Blair are the three Toledoans who have organized the company. The name of the company's cars will be the Maumee, and its first one will be ready early next month. It will not, however, seek to do much business this season, but will be ready early next.

Lehr Agricultural Company May Make Autos.

The Lehr Agricultural Company, of Fremont, Ohio, is about to break into the automobile field. It has made one car as an experiment, and as it has proven a success the company is arranging to add automobiles to its list of regular products. The company has not yet fully determined as to the details of its new undertaking, but President Lehr states that within two months his company will have decided and will have arranged to begin the manufacture of automobiles in earnest.

GROUND BROKEN FOR NEW GARFORD PLANT.

ELYRIA, O., May 7.—The Garford Company has broken ground for its new plant, which will be one of the largest identified with the automobile industry in the country. The Lake Shore & Michigan Southern railroad is building a spur line to the plant. Mr. Garford has been largely instrumental in the formation of a traction company which proposes to build an electric line from the factory district of the city to the center of the business district, the idea being to supply the best possible transportation facilities for the employees.



PRESIDENT GEORGE N. PIERCE BREAKING GROUND FOR THE NEW PIERCE FACTORY, BUFFALO, N. Y.—THE FACTORY SITE COMPRISES FIFTEEN ACRES OF THE OLD PAN-AMERICAN GROUNDS.—CHARLES CLIFTON, PRESIDENT OF THE A. L. A. M., STANDS BESIDE THE SOD BREAKER, WHILE THE FAMILIAR FACE OF HIS SON PERCY IS EASILY DISTINGUISHED.

SLOW DELIVERIES IN QUAKERTOWN.

PHILADELPHIA, May 7.—“Slow deliveries,” the bane of all agents and branch managers, is again the cry all along “the row,” and this despite the fact that the factories are doing as well in this respect, if not better, than was looked for only two short months ago. The trouble is with the demand, which is far greater than was anticipated. Just where all the cars that have been “sold” are to come from is a mystery. Many who contracted the automobile fever at the local show last March, and who delayed ordering in the belief that they would experience no trouble in securing any car they wanted if they would offer spot cash, now realize their mistake. Offers of premiums for early delivery are a daily occurrence in “row” establishments, and at the present rate any old kind of a car, even of the second-hand variety, will be in demand by July 1.

The Marion car made its appearance on “the row” last week. It will be handled here by Thomas M. Twining, who is now fitting up quarters at 218 North Broad street.

Local agents are beginning to take on as many agencies as they can see in sight, in the belief that if early delivery cannot be promised on one car it may be on another. The South Broad Automobile Company, at 729 South Broad street, who recently acquired the local rights for the Gale and the Dorris, announced on Saturday last that the Duquesne had been added to its line. In a multiplicity of cars there is wisdom—and profit.

The hammer and saw of the carpenter are still at it, pegging away merrily in an effort to make the accommodations fit the demand. The Colonial Auto Company, at Fifteenth and Oxford streets, announces the completion of the improvements necessary to house its stock of Dolson cars, the agency for which it recently acquired, and purposes holding “open house” during the coming week to properly celebrate the event. A similar announcement is made by the Brazier Automobile Works, which handles the Marmion here and has been doubling its garage accommodations.

In the line of accessories, the newest local acquisition is the Brown Auto Top Company, 1327 Buttonwood street—just off “the row”—which makes, repairs, and alters automobile tops, storm and glass fronts, slip covers, and wind guards, besides turning out a complete line of car trimmings.

THE BACKWARD CITY OF INDIANA.

NEW ALBANY, IND., May 7.—This city is known as the dark spot of Indiana automobiling, and the determined effort on the part of city and county authorities to make the use of an automobile almost prohibitive through excessive fees and penalties is bearing successful fruit.

New Albany is a city of several thousand inhabitants, but despite this fact there are only two automobiles in the city, one an Olds runabout and the other a Locomobile. The situation is too discouraging for others to purchase automobiles, and the two men who own them find their cars a burden because of the exorbitant sums they are compelled to pay for operating them.

The City Council some time ago fixed the annual city license on automobiles at \$10 a year, probably the highest city license fee in the State. The license on a horse and wagon is \$1.50 a year. Toll, one of the relics of barbaric days in some parts of Indiana, has been almost doubled on county pikes so far as automobiles are concerned, drivers of motor cars being compelled to pay five cents a mile toll.

The two owners are O. C. Thompson, an electrician and one of the leading citizens of the city and Clarence Walker, a well-known business man. These two men are practically powerless to make a fight because of their minority. So burdensome has the situation become that Thompson has appealed to some of the leading automobile men of Indianapolis to assist in a fight against the city and county authorities. It is probable that this aid will be given willingly and the excessive license and toll will no doubt be given a thorough test in the courts and, if necessary, will be carried to the Supreme Court of the State.

KANSAS CITY TRADE ITEMS.

KANSAS CITY, May 7.—J. D. McInnes, for years a Kansas City railroad man, has been given the agency for the Cadillac, succeeding Fred Pattee. Mr. McInnes has taken the old garage of the Kansas City Automobile Co., on McGee street.

E. P. Moriarty & Co. have taken the agency for the Peerless and have contracted for three cars this season. This firm now also handles the Packard, Pierce, Stevens-Duryea, Winton and Autocar.

C. O. Meade, manager of the local Ford branch, reports a steady and heavy demand for the new four-cylinder runabout, but will not promise deliveries inside of thirty days. He says it is the factory plan to put through a large number at once, and therefore the work of assembling is held back while a large number of parts are taking the efforts of the factory. One hundred of the cars are to be assembled each day, factory advices inform him.

The Kansas City Motor Car Co. proposes to change its model and build only six-cylinder cars for the remainder of the season. The factory at Sheffield is running with a small force. Work on the downtown salesroom, at Ninth and Central streets, is progressing rapidly.

The Smith Automobile Co., of Topeka, Kans., is adding a considerable force to the number of men already employed. The car made by the company this year shows many radical changes from last year's model.

FROM THE STANDARD ROLLER BEARING CO.

Editor THE AUTOMOBILE:

[331].—In your issue of April 12, on page 644, we note that you have a rather full account of our patent suit recently instituted against the Hess-Bright Manufacturing Company for infringement of our patents, covering annular ball bearings. The article in question is complete, so far as it goes, and it appears to give a thoroughly satisfactory explanation of the matter except in one respect, and we think that there may be a misunderstanding regarding the subject unless you make a correction. You state that if the court should decide in our favor, the construction of annular ball bearings would be open to any concern that might care to use them, as the patent referred to will expire next December. This statement is not correct, as the patent referred to only covers the use of yielding partitions or springs between the balls, and does not refer to the particular type of race and cone used in annular ball bearings. This latter is covered by patent No. 434472, issued in 1890, and it is also covered by patent No. 615070, 1898, both of which patents are owned by us. There are other patents which we own, covering modifications of the different types of annular ball bearings, in addition to those mentioned.

We trust it will be agreeable to you to make some statement to this effect in another issue of your paper, as otherwise the trade might misunderstand the previous article and feel warranted in making the bearings, when in reality no one has a right to do so.

STANDARD ROLLER BEARING COMPANY,

S. S. Eveland, Vice-president and General Manager.

Philadelphia, Pa.

A THING IN FAVOR OF THE AUTOMOBILE.

From the Muncie, Ind., *Star* comes this editorial paragraph: “There is one thing to be said in favor of the automobile. Its necessary and frequent repairs have caused many repair shops to be started and put a number of competent machinists in possession of paying jobs. It has also established numerous auto inns and stables and supply houses. Make a long mark in its favor.”

JAYNES SELLS HIS BUFFALO BUSINESS.

The well-known Buffalo automobile trade representative, W. C. Jaynes, has disposed of his interest in the Jaynes Automobile Company, of that city.

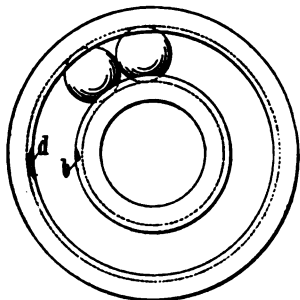
The Duke of Schleswig-Holstein is about to tour through the Balkans in his 45-horsepower car, visiting the king of Roumania and the Sultan on his way.

Patents

Ball Bearing.

No. 818,734.—E. Blin, of Aubervilliers, France.

This is a ball bearing of the standard annular type, in which the balls are inserted through recesses *b d* in the sides of



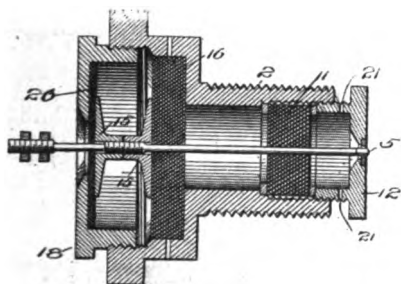
BLIN ANNULAR BALL BEARING.

the races. These recesses do not extend quite the full depth of the ball tracks, and after the race is half filled the balls must be forced in by pressure. When once in, however, they will not come out.

Spark Plug.

No. 818,372.—B. W. Hallstead, of Scranton, Pa.

This is a spark plug designed to afford unusual protection to the insulating surfaces against deposits of carbon from the cylinder. It consists of the following principal elements: The outer shell *2* is threaded to receive internally at its small end the cap *12*, by which the mica disks *11* are compressed between a pair of rings. These mica disks are not necessarily a gas-tight



HALLSTEAD SPARK PLUG.

fit on the central insulated stem *5*, but they serve to hold it in position. The tightness of the plug is secured by other mica disks *16*, which are held in place by the two flanged nuts *15 15*, one of which bears against the mica disks *26* in the outer cap *18*. The spark jumps from the end of *5* to the middle of the cap surrounding it. Holes *21* are drilled in the cap to allow play of the gases in and out. The position endwise of the stem *5* may be adjusted by screwing it in the flanged nuts *15*.

Fans for Air-Cooled Engine.

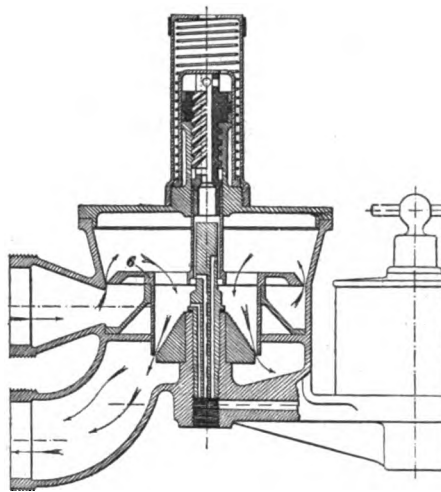
No. 818,735.—F. H. Bogart, of New Britain, Conn.

These fans are supported over the cylinders as shown in the drawing, and are operated by bevel pinions from a horizontal shaft driven by a round belt from the crankshaft of the engine. The fans and the shaft driving them run in ball bearings and are supported wholly independently of the engine cylinders.

Carbureter.

No. 818,853.—L. Renault, of Billancourt, France.

A carbureter whose principal feature is the provision of a plurality of orifices in the spraying nozzle, together with a shutter or sleeve slipping over the spray nozzle in such a way as to shut off one orifice after another as the volume of the aspirated charge is reduced. The air follows the course of arrows and lifts the annular valve *6* as the speed increases. The form of this valve is such as to restrict the pas-



RENAULT CONSTANT MIXTURE CARBURETER.

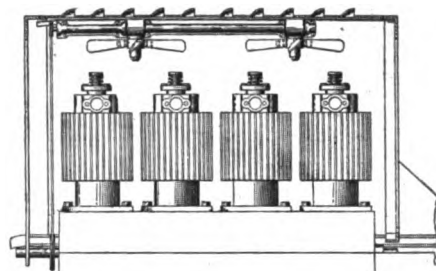
sage of air both before and after it passes the spray nozzle, thereby offsetting the tendency to reduce the richness of the mixture at slow speeds.

Three-Speed Planetary Transmission.

No. 817,908.—W. Folberth, of Cleveland, Ohio.

This is a transmission in which, by the use of two clutches, it is possible to obtain three forward changes and reverse, with a small number of gears. The power is ap-

Fig. 1.



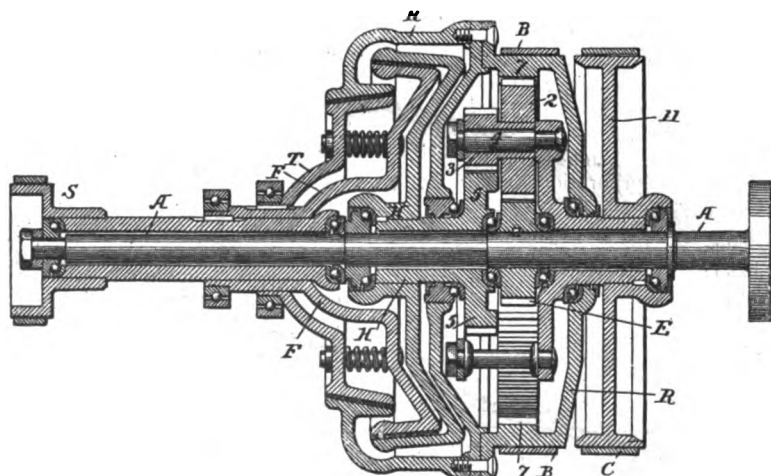
BOGART COOLING FAN ARRANGEMENT.

plied through shaft *A*, and delivered from the universal coupling or sprocket pinion *S*. Pinion *E* is keyed on *A* and transmits the power for all speeds. It meshes with planetary pinions *2*, which are secured to pinions *3*, meshing with gear *5*. Pinion *2* meshes with internal gear *7*, which is connected to clutch member *R*, and gear *5* is connected to clutch member *H*. For the high speed, both these clutches are engaged by permitting the related clutch members *T F* to take the position shown. The drive is then direct, all parts being locked together. For the slow speed forward, the friction band *C* is tightened, and clutch members *R T* alone are engaged by moving *T* to the right. Then the stud *4* is held stationary and gear *5* is rotated in the same direction as *A*, but at a much slower speed. For the intermediate speed, friction band *C* is released, and band *B* is tightened, the clutches remaining as before. Now *7* is stationary and *2* rolls around inside it, imparting a faster motion than before to gear *5*. For the reverse, *B* is released and *C* tightened, the clutch *H F* is engaged and *R T* is released. This holds *4* stationary again, and imparts the reverse motion to *7* and *R*.

Process of Burning Acetylene Gas.

No. 817,751.—J. B. Carroll, of Chicago, Ill.

A patent on the process of burning acetylene in a burner similar to that shown in patent No. 817,750.



FOLBERTH THREE-SPEED PLANETARY TRANSMISSION.

NEWS AND TRADE MISCELLANY.

One of the latest purchasers of a Thomas "Flyer" in New York City is William Randolph Hearst.

Work has been started on an addition to the plant of the Buick Motor Works, which supplies all motors for Buick cars, at Flint, Mich.

The Utica (N. Y.) Motor Car Company has moved its offices and salesrooms from Catharine and John streets to 333-337 Bleecker street, that city.

The plant of the Practical Automobile Company, at Genoa, Ill., has been practically finished and the installation of machinery has commenced.

The Motor Car Company, of Newark, N. J., is having plans drawn for the enlargement of its plant on Halsey street, between William and Hill street, that city.

The G & J Tire Company, of Indianapolis, opened a New York City branch store on May 1 at 10 West Sixtieth street. The new store will be in charge of A. T. Smith.

The Queen Manufacturing Company, makers of automobile creepers and other novelties, will remove its plant from Marshalltown, Ia., to Webster City, that state.

A tire guard, recently invented by Louis Slama, of Humboldt, Neb., will be manufactured in that city by Cooper & Linn, with whom the inventor has associated himself in a business way.

A long lease has been taken by the Auto Top Equipment Company, of New York, on the four-story building at 142 West Eighteenth street, which will be used as a manufacturing plant.

A new garage has been opened by the Thompson-Schoeffel Company, of Rochester, N. Y., on Caledonia avenue, corner of Spring street, that city. The old garage was recently destroyed by fire.

Work on the addition to Studebaker Bros., automobile factory at South Bend, Ind., is progressing rapidly. It is expected that the building will be ready for occupancy by August 1.

Work is progressing on the plant of the Mason Automobile Company at Des Moines, Ia. The location is at East Fifth and Market streets and the building will be two stories in height, 50 by 154 feet.

The Mora Motor Car Company, 317-320 Livingston Building, Rochester, N. Y., has issued in pamphlet form a handy digest entitled "Complete Motor Car Laws of the United States." A two-cent stamp will obtain a copy.

It is likely that the Pittsburg Automobile Orphans' Day will be held again this year in the latter part of May, and at least one other automobile benefit for the inmates of hospitals and those who are suffering otherwise is being planned.

The Rogers Automobile Company, a Springfield, Mass., corporation, has filed a petition with the courts for a dissolution. The petition states that there are no outstanding debts or liabilities and that the company has ceased to do business.

The Auto Transit Company, of Philadelphia, was chartered by the State Department at Harrisburg, Pa., last Friday, with a capital of \$1,000,000. Charles Berg is the leading spirit of the new company, and Charles F. Pierce, 1203 Erie avenue, is the treasurer.

The F. B. Stearns Company, of Cleveland, is now benefiting from the results of having its work at the factory well advanced

early in the season. The house is now able to ship a car a day, which, for one that requires over 2,000 hours' labor for each machine, shows a well-developed working system.

The Interstate Automobile Clearing Company, of 39 East Forty-second street, New York City, has been incorporated, with the following officers: President, William E. Metzger; vice-president and secretary, G. H. Stillwell; treasurer, C. A. Wardle. This house makes a specialty of second-hand automobiles.

One free factory site and about a dozen others for various considerations have been offered in Zanesville, O., to the Oscar Lear Automobile Company, of Columbus, for the erection of a factory for the manufacture of the Frayer-Miller cars. Ten acres or more is wanted by the company.

Branch stores for the sale of Pennsylvania clincher tires and mechanical rubber goods have been opened at 1241 Michigan avenue, Chicago; corner of Main and Tupper streets, Buffalo, and at 102 North Pryor street, Atlanta, Ga. Other branch stores had previously been established in New York, Philadelphia, Boston and London.

By an ingenious method the Hartford Suspension Company is enabled to practically transfer the 1905 Truffault-Hartford suspensions into all the advantages of the new 1906 suspension, and many of their customers are obtaining the advantages of the new models by having them changed at the factory, which is now at Clarkson and West streets, New York.

There may be a few minor changes in the details of the construction of the Maxwell line next year, but the same general lines will be followed in 1907, the product having met with much favor on the part of agents and the buying public. The above announcement has been officially made by the manufacturers, the Maxwell-Briscoe Motor Car Company, of Tarrytown, N. Y.

An increase of \$223,830 in gross sales in 1905 over the preceding year is shown by the annual report of the Consolidated Rubber Tire Company. This increase in sales and income from other sources resulted in a net income increase amounting to \$14,253. The actual net profits are given as \$57,010, which was applied to the payment of interest on the income bonds. The company makes solid tires for carriages and automobiles.

The Kansas City Motor Company has made arrangements to erect a large factory in Kenosha, Wis., according to local report, General Manager Wheeler having signed the contract for the construction of a \$250,000 plant just north of the city. The company expects to employ from 300 to 500 workmen. It will issue bonds aggregating \$100,000 and sell building lots adjoining the factory, a \$100 bond going with each lot sold.

Director Frank Ridgway, of the Department of Public Safety of Pittsburg, is waging the most vigorous campaign against the violators of automobile laws. Last week two more prominent young society women were made to feel the weighty hand of the law, and a number of arrests of well-known men have been made since Director Ridgway took office. His efforts are heartily supported by the Automobile Club of Pittsburg.

The Olds Motor Works has shipped to New York the *Pirate*, a racing car which a few seasons ago made phenomenal time,

and was the first American car to do the mile under one minute. The *Pirate* has been engaged by Liebler & Company to be used in their play, "The Vanderbilt Cup," at the Broadway Theater. Ernest Keeler, who is to drive the new Oldsmobile racer in the Vanderbilt race this fall, will run the *Pirate* in the stage race with Tom Cooper, his opponent.

Word has just been received by the H. H. Franklin Mfg. Co., of Syracuse, N. Y., from R. C. Hamlin, its Los Angeles agent, to the effect that Walter Scott, who is best known to the American public as "Death Valley Scotty," recently purchased a six-cylinder Franklin. Mr. Hamlin concluded the deal with the miner-actor after a demonstration in which all of Scotty's cravings for speed were amply satisfied. Speculation has been rife as to the source of Scotty's reputed wealth, and recently it has been rumored that he has lost his roll. Evidently, however, he had about \$4,000 more than he could handily spend.

Twenty six-cylinder Fords are on the way from this factory at Detroit to the New York branch. Manager Gaston Plaintiff states that immediate deliveries can now be made, and calls attention to the six-cylinder tendencies of the foreign makers as a justification of the Ford idea. He states that many of the foremost foreign automobile manufacturers whose cars sell from three to five times the price of the six-cylinder Ford touring car, have announced that they will make six-cylinder cars in 1907. Several of the most conservative of the German and French concerns will make racing cars this year to be driven by engines of the six-cylinder type.

Trade changes in Chicago on or about moving day, May 1, included the following: The White Garage took possession of the entire building at 240 Michigan avenue, the second floor of which it occupied for several months; the Bennett-Bird Company, representing the Corbin and Dolson cars, moved to 1470 Michigan avenue; the Hamilton Automobile Company occupies the first floor of 1251 Michigan avenue, and Fanning & Canary, Michelin tire representatives, occupy the second floor at that number, the Fisk Rubber Company, which occupied the building, moving to 1440 Michigan avenue; Apperson Brothers moved to 1240 Michigan avenue, and the Clement-Bayard Automobile Company and Jerome A. Ellis Company now jointly occupy the building at 1408 Michigan avenue. The American Locomotive Company, which is building the Berliet, will open a salesroom as soon as its new building on Michigan avenue near Sixteenth street, is completed.

The Standard Roller Bearing Company, of Philadelphia, whose large plant is located at Forty-eighth street and Girard avenue, that city, is now building a drop forge plant, 80x120 feet, which will be equipped with special drop hammers of 1,200 pounds, 2,000 pounds, and 3,000 pounds each. The company is also erecting a four-story building, 210x100 feet, which will be devoted to the manufacture of annular ball bearings almost exclusively, a small portion of it to be used for the manufacture of automobile axles. The above-mentioned additions will give to the Standard Roller Bearing Company a total of 355,000 square feet of factory floor space. Everything that is used in the business is made under the factory roof except the steel bars. The plant consists of seven distinct departments, as follows: Steel foundry, brass foundry, crucible steel casting plant, drop forge plant, steel ball plant, general machine shop, and manganese bronze factory. Eight hundred hands are employed the year round.

INFORMATION FOR BUYERS.

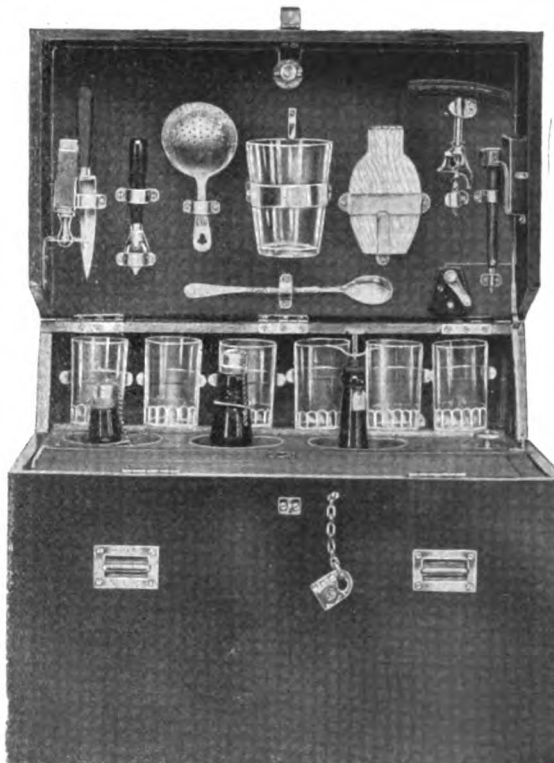
CLEANOLA.—The makers of this preparation describe it as a perfect automobile body cleaner and varnish preserver. It is first of all a varnish cleaner, and is said to renew and preserve the original luster to a marked degree, and has no unpleasant odor, is a good disinfectant, and is not inflammable. It can be applied either with a brush, cotton waste, or sponge, and is then wiped dry and polished with a dry cloth or waste. It is one of several specialties of the same name, manufactured by the Cleanola Company, 907 West Diamond street, Allegheny, Pa.

GROWTH OF A TIRE COMPANY.—Among the many concerns allied with the automobile industry the Firestone Tire and Rubber Company holds a conspicuous place. Energy and a determination to furnish only high-grade tires has enabled the management to increase the demand for its product so rapidly that increased additions to the plant have been made necessary. The commodious buildings shown in the illustration are equipped throughout with the newest modern machinery, and special attention has been given to the sanitary regulations. A new 800-horsepower engine has just been installed, and the buildings are electrically lighted by the company's own plant.

During the existence of the Firestone Company it has done much to perfect solid and pneumatic tires. Attention was at first directed to the manufacture of solid rubber tires for automobile trucks. The success achieved in this direction was so gratifying that two years ago the company decided to enter a new field, having secured a patent on a mechanically fastened pneumatic tire. This tire, it is claimed, cannot possibly come off in use, but may be easily and quickly removed or replaced by the most inexperienced person. Other advantages claimed, are that danger of pinching the inner tube, and rim cutting, are wholly eliminated. Although this tire has been on the market but a short time, it has been thoroughly tested, both in the factory and actual service.

The Firestone Tire and Rubber Company is frequently called the "rubber tire specialists," as its experts carefully study the requirements of a good tire for vehicles of all descriptions under varying circumstances. It is the company's boast that it can properly equip any vehicle with rubber tires from the lightest carriage to the heaviest truck. Its policy is to make every tire as good as possible in both construction and quality. A continuance of this policy cannot fail to bring continued success to the Firestone Company.

A PORTABLE BUFFET.—This creation is unique in its character. It is a combination of an ice box, light and compact, constructed on scientific principles, with a mahogany cafe top. The accompanying illustration tells the story more forcibly than any word picture of its form and design, and the purpose for which it is used. The ice chamber is composed of a secret compound of great strength and considerable lightness, which has extremely cold insulat-



WITHERSPOON PORTABLE BUFFET FOR AUTOMOBILES.

ing qualities. This compound is reinforced by box linings of basswood, and the interior lining is of tinned copper, which completely seals the interior, making it practically impossible to spill the contents. The box is fitted with a specially designed drip valve, operated from above, which allows waste water to flow off, and the valve outlet is flush with the outside, a brass apron preventing liquids from staining the exterior.

The box is sealed by a cover of solid mahogany, which when open forms with the aid of an automatic metal holder a rigid

bar piece. Another piece of wood extending to the rear of the buffet forms the opening of the bottle tubes and acts as a receptacle for the drinking glasses. The bottle holders are water-tight tubes of tinned sheet copper, and have a diameter of 3-7-8 inches, and are of sufficient depth for standard quart bottles. The cover has a recessed interior containing bar supplies and fixtures. A two-candlepower electric light, for use at night, completes the interior fittings.

The exterior is fitted with polished brass handles, and can be easily carried in one hand like a dress suit case. Its outside dimensions are 21 inches long, 15

inches high and 10 inches wide, and from 15 to 20 pounds of ice can be carried. The whole outfit is made so that it can be readily fastened to the running board or other parts of the automobile, for which purpose it is primarily intended. The Witherspoon Buffet Company, 145 East Forty-second street, New York, are the manufacturers.

Personal Trade Mention.

Hon. Ben. L. Jones, president of the Macon (Ga.) Automobile Club, is forming a corporation for the manufacture of automobiles in that city.

John L. Poole, foreign representative for the Olds Motor Works, has arrived in this country on a business trip to the factory at Lansing, Mich.

Thomas W. Fahy, of Hartford, Conn., recently with the Locomobile factory at Bridgeport, has accepted a position in New York as manager of a large garage and salesroom.

Simeon H. Baker has severed his connection with the Baker-Cormerais Motor Car Company, Premier agents at Boston, Mass. The business will be continued by the H. D. Cormerais Motor Car Company.

E. D. Winans, general manager of the Michelin Products Selling Company, Inc., of New York, has acquired the services of M. J. Dobler, as special representative. Mr. Dobler has numerous friends in the trade, who will remember him at the inception of the automobile and bicycle tire industry in this country.

E. Rand Hollander, of the Hol-Tan Company, of New York, American representatives of the Fiat, has returned home from Italy, where he has been visiting the Fiat factory, at Turin. Mr. Hollander was much impressed with the conditions of the automobile industry in Italy, and says the Italians are proving themselves to be very expert mechanics, one of their chief characteristics being the care they give to their work. "Italy is also taking its place in body building," says Mr. Hollander. "One of the big plants there is known as the Carozzeria Rothschild Italiano, in which the Parisian house of Rothschild is a large stockholder. Another plant is being built by Locati & Torretti. The fact that Italy has very few labor strikes has been largely instrumental in the erection of these large works in Italy instead of in France." While in Italy Mr. Hollander was elected a member of the Italian Automobile Club, and later will be named as its official representative to the Automobile Club of America, in charge of the Italian team for the Vanderbilt Cup race. He states there will be three Fiats in the race.



AKRON PLANT OF FIRESTONE TIRE AND RUBBER COMPANY.

INDEX TO ADVERTISERS

A

Acetylene Gas Illuminating Co.	31
Acme Motor Car Co.	78
Add-Wear Tire Sleeve Co.	63
Aerocar Co.	91
Am. Anti-Puncture Tire and Auto Co.	35
American Battery Co.	38
American Ball Bearing Co.	32
American Coll. Co.	30
American Generator Co.	40
American Machine Mfg. Co.	33
American Motor Truck Co.	76
American Pneumatic Wheel Co.	43
American Veneer Co.	37
Anderson Forge & Machine Co.	33
Arc Spark Plug Co.	55
Archer & Co.	31
Artisan Brass Co.	31
Aster Co., L.	43
Atwood Mfg. Co.	36
Auburn Automobile Co.	32
Audel & Co.	79
Auto Pump Co.	50
Auto Rebuilding Co.	33
Auto Safety Starting Crank Works	54
Automobile Equipment Co.	30
Automobile Supply Co.	31

B

Badger Brass Mfg. Co.	53
Baker Motor Vehicle Co.	78
Baldwin Chain Mfg. Co.	28
Bates Forge Co.	33
Beaver Mfg. Co.	39
Bemus, T. Alton.	74
Bentley, Joseph.	34
Beverley Mfg. Co.	33
Blasler Mfg. Co., M. E.	34
Blue Book.	43
Boker & Co., H.	30
Boston Mechanical Co.	41
Bowser & Co., S. F.	80
Boyle & Co., John.	56
Briscoe Mfg. Co.	33
Brownell-Trebert Co.	36
Buckeye Jack Mfg. Co.	58
Buckeye Mfg. Co.	86
Bullard, J. H.	49
Buob & Scheu.	34
Byrne-Kingston Co.	61

C

C., B. & Q. Ry. Co.	42
Cadillac Motor Car Co.	90
Capitol Foundry Co.	33
Carr, F. S.	34
Central Body Co.	32
Central Garage.	34
Chalfonte Hotel.	51
Champion Co., A.	31
Champion Mfg. Co.	30
Chandlee & Chandlee	45
Chase & Co., L. C.	40
Chelsea Clock Co.	30
Chicago, M. & St. P. Ry.	46
Cleanola Co.	37
Cleveland-Canton Spring Co.	38
Collins & Sons, G. A.	34
Connecticut Tel. & Electric Co.	70
Continental Caoutchouc Co.	65
Continental Motor Mfg. Co.	36
Cooper-Hewitt Electric Co.	49
Coops Co., C. W.	34
Corbin Motor Vehicle Corporation.	Cover
Corcoran Lamp Co.	53
Covert Mfg. Co.	32
Crawford Automobile Co.	80
Crucible Steel Casting Co.	33
Cullman Wheel Co.	33

D

Dayton Electrical Mfg. Co.	35
Dayton Motor Car Co.	77
Deere-Clark Motor Co.	76
Detroit Auto Vehicle Co.	83
Diamond Chain & Mfg. Co.	83
Diamond Rubber Co.	66
Diets, R. E.	49
Diezemann Shock Absorber	54
Dixon Crucible Co., Joseph.	48
Dolson Automobile Co.	72
Dorris Motor Car Co.	80
Duplex Ignition Co.	46
Duquesne Construction Co.	31
Dover Stamping & Mfg. Co.	30
Dow Portable Electric Co.	35

E

E. H. V. Co., The.	78
Eastern Oil Tank Co.	32
Eclipse Buggy Co.	34
Edmunds & Jones Mfg. Co.	32

Eldredge Electric Mfg. Co.	30
Electric Rubber Mfg. Co.	35
Electric Vehicle Co.	79
Electrical Mfg. Co.	82
Elmore Mfg. Co.	85
English Daimler Co.	38
English & Mersick Co.	31
Erie Railway.	50
Excelsior Supply Co.	30

F

Fairmount Engineering Works.	32
Firestone Tire & Rubber Co.	Cover
Fisk Rubber Co.	Cover
Fisher Automobile Co.	59
Ford Motor Co.	85
Forest City Motor Car Co.	80
Franklin Mfg. Co., H. H.	87
Franklin Portable Crane & Hoist Co.	38
Frayser-Miller Motor Car Co.	44
Fremont Mitten & Glove Works.	30

G

G & J Tire Co.	68 and Cover
Garage Equipment Co.	32
Garford Co., The.	41
General Electric Co.	79
Gibson House.	51
Gilbert Mfg. Co.	35
Glover, George E.	28
Goodrich Co., B. F.	67
Goodyear Tire & Rubber Co.	64
Gramlich Chemical Co.	32

H

Haddon Hall.	50
Ham Mfg. Co.	52
Hardy Co., The R. E.	31
Harris Oil Co., A. W.	46
Harrison Wagon Co.	58
Hartford Machine Screw Co.	32
Hartford Rubber Works Co.	64
Hartford Suspension Co.	81
Hassler Co., O. C.	30
Hatcher Auto Parts Co.	40
Havemeyer Oil Co.	30
Hawkins Mfg. Co.	39
Haynes Automobile Co.	88
Healy Leather Tire Co.	69
Heinze Electric Co.	49
Hicks Speed Indicator Co.	55
Hoffecker Speed and Mile Register Co.	48
Hoffman, George W.	31
Holley Bros. Co.	58
Holsman Automobile Co.	41
Hopewell Bros. Co.	48
Hotchkiss, P. M.	48
Hydraulic Oil Storage & Distributing Co.	28

I

Imperial Brass Mfg. Co.	37
Indianapolis Auto Top Co.	34
Iroquois Motor Car Co.	47

J

Janney, Steinmetz & Co.	33
Jeffery & Co., Thomas B.	89
Jersey Brake Co.	40
Johnson Sporting Goods Co., Iver.	30
Jones Speedometer.	76

K

Kalisch Air Brake Co.	42
Kellom, Chas. F.	28
Kilgore Auto Air Cushion Co.	54
King Mfg. & Garage Co.	34
Kinsey Mfg. Co.	31
Kirkman Motor Mfg. Co.	40
Knox Automobile Co.	81

L

Lafayette Hotel.	51
Leavitt, Gilbert.	28
Lipman, C. E.	30
Lobe Pump Co.	33
Locke & Co.	32
Locomobile Co. of America, The.	Cover
Logan Construction Co.	77
London Auto Supply Co.	34
Loomis Auto Car Co.	31
Loring, E. J.	32
Lozier Motor Co.	36

M

M. & M. Mfg. Co.	35
Manhattan Lamp Works.	53
Manhattan Storage Co.	45
Manley, Chas. H.	72
Manning Mfg. Co.	31
Manufacturers Motor Car Co.	41
Matheson Motor Car Co.	83
McCord Mfg. Co.	37
McDonald, Wessels & Ames Co.	33
Mendenhall, C. S.	50
Merkel Motor Co.	38
Merritt Co.	34
Meyer, C. G.	34
Mezger, C. A.	57
Miami Pattern Works.	33
Michellin Products Selling Co.	66

Michigan Top Co.	34
Midgley Mfg. Co.	32
Miller, Charles E.	58
Mitchell Motor Car Co.	75
Moline Automobile Co.	77
Monarch Mfg. Co.	39
Monitor Speed Recorder Co.	21
Mora Motor Car Co.	74
Morgan, B.	56
Morgan & Wright.	67
Mosler & Co., A. R.	21
Moss Photo Engraving Co.	78
Motor Car Equipment Co.	79
Motor Car Specialty Co.	57
Motor & Mfg. Works Co.	36
Mutty Co., L. J.	34
Myers-Dayton Top Co.	34

N

N. Y. & N. J. Lubricant Co.	74
National Battery Co.	41
National Brake & Clutch Co.	73
National Motor Vehicle Co.	89
Neustadt Auto & Supply Co.	59
Never-Miss Spark Plug Co.	31
Newark Merchandise Co.	52
Newmastic Tire Co.	35
New England Motor Co.	31
New Jersey Tube Co.	28
New York Gear Works.	87
New York Sporting Goods Co.	48
Nicholsberg Mfg. Co.	37
No-Ko-Rode.	71
Nordyke & Marmon Co.	84
Normandie Hotel.	51
Northwestern Railway.	39
Nungesser Electric Battery Co.	52
Nuttall Co., R. D.	33

O

Ofeldt & Sons.	33
Olds Motor Works.	38

P

Pacific Tucking & Mfg. Co.	39
Packard Electric Co.	31
Packard Motor Car Co.	32
Pantasote Co.	75
Parish & Bingham Co.	33
Pedersen, J. T.	32
Peerless Motor Car Co.	94
Pennsylvania Petroleum Co.	60
Perfect Mfg. Co.	45
Philadelphia Grease Mfg. Co.	32
Pigot, Sayre & Co.	22
Pioneer Brass Works.	22
Pittsfield Spark Coil Co.	45
Pneumatic Tire Protector Co.	32
Pope Motor Car Co.	52
Post & Lester Co.	47
Prest-o-Lite Co.	99

R

Railway Appliances Co.	89
Raines & Co.	67
Rainier Co., The.	27
Rajah Auto Supply Co.	27
Randall-Falchney Co.	28
Remy Electric Co.	24
Riverside Body Factory.	39
Robert Instrument Co.	Cover
Robinson & Son Co., Wm. C.	39
Rochester Automobile Co.	32
Royal Battery Co.	32
Royal Equipment Co.	32
Royal Motor Car Co.	73
Rubay, Leon.	39
Rushmore Dynamo Works.	53
Ryan & Long.	74

S

Sager Co., J. H.	74
Saks & Co.	27
Salomon Co., John A.	39
Samson Leather Tire Co.	39
Shaw, Ora D.	32
Shawver Mfg. Co.	32
Sheddan Mfg. Co.	32
Sibley & Pittman.	32
Skinner & Skinner.	32
Smith Co., A. O.	32
Smith Mfg. Co., R. H.	32
Snow, H. N.	32
Speed Changing Pulley Co.	32
Spicer Universal Joint Mfg. Co.	32
Spittdorf, C. F.	32
Sprague Umbrella Co.	32
Springfield Metal Body Co.	32
Springfield Moulding Works.	32
St. Anne Kerosene Motor Co.	32
St. Louis Motor Car Co.	32
Standard Connecting Rod Co.	32
Standard Roller Bearing Co.	32
Stearns Co., F. B.	32
Steel Ball Co.	32
Sterling Electrical Mfg. Co.	32
Stevens Arms & Tool Co.	32
Stevens & Co.	32
Strett Machine Co., A.	32
Suffolk Chemical Co.	32
Supplementary Spiral Spring Co.	32

THE AUTOMOBILE

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No. 20

WILKES-BARRE MOUNTAIN WAS A TOUGH CLIMB

By A. G. BATCHELDER.

WILKES-BARRE, PA., May 10.—'Twas a rough, rugged climb the motor-driven craft had in the ascent of Wilkes-Barre Mountain, with its hazardous Devil's Elbow and mocking Prospect Rock, but the autos unhesitatingly tackled the road which aggressively challenges all through the name of "Giant's Despair," gained in years during which many a poor horse has failed to meet the task imposed by the steep and winding mountainside. A few of the climbing autos succumbed en route, but the others sturdily conquered the tortuous grade, the high-powered ones rushing upward at breakneck pace and in perilous manner

skidding around the abrupt turns and bounding over the recurring waterbreaks. An English Daimler excelled in the mile and a bit more clamber skywards, and its steersman was Harding, scarce a year here from London, who had as a comrade Church of the ministerial mien and yet one that had sought adventure as a participant in the Peary relief expedition. There was a fair degree of incident in the racking and swerving journey from the base at Georgetown to the summit at Laurel Run, if Church's observations were distinctly transmitted, for, unlike Harding, he had a mind untrammelled with the guiding of the white-coated flyer and



CARS ASSEMBLING IN EARLY MORNING AT BASE OF WILKES-BARRE MOUNTAIN.—ITS ROAD IS ROUGH AND WINDING.



HARDING AND CHURCH IN ENGLISH DAIMLER WINNER.

opportunity for looking about when not engaged in the difficult job of hanging on.

"Get ready!" "Coming! Coming!" were the high-keyed warnings that came over the telephone to us at the top. Then a pause and next the staccato voice of Morgan shouted "Go!" to the accompaniment of the sharp report from Starter Wagner's pistol. Before the signal had grown cold I had communicated it to Timer Dieges, who "clocked" with two watches and had assistants with other timepieces.

At the outset of his journey Harding figured that the Daimler would do better on second speed, and Church afterwards said this was plenty fast enough for him, considering the snake-like bends of the road and its uneven surface. The Daimler chugged along until it reached a point just below the famous Devil's Elbow, where on each side of the roadway there was an uncom-



S. H. HANCOCK AT SUMMIT WITH STEVENS-DURYEA "BIG 6."

fortable looking ravine, and the grade was beginning to make itself apparent. This was the stretch of the route where the calamity predictors said many machines might be picked up in pieces. But Harding didn't give the matter a thought, and Church never whimpered.

Next came, up to the Mountain House, a 20 per cent. grade, at which the Daimler clawed in good style. A grateful hundred yards or so of level going only prepared the energetic auto for the hardest inning of the climb—a 27 per cent. grade that broke the hearts, or rather the motors, of several of the lesser powered cars. The difficulties were increased by water-breaks at ten-yard intervals which tried both the skill of the pilot and the staunchness of the machine. Harding didn't have time to enjoy the scenery, but Church had a magnificent fleeting view of the panorama of the Wyoming Valley, though the proximity of ragged ledges of rock and an uninviting old stone fence prevented un-

qualified enjoyment of the picturesque country below. It was just before rushing this trying grade that Harding shifted to third speed.

On the top we now plainly could hear the throbbing monster as it fought its way to the finishing line. Suddenly it burst into view, plunging from one side of the road to the other, and scattering like chaff those incautious spectators who would persist in taking long chances, lured by their foolish curiosity. As the Daimler struck a "thank-you-ma'am" that sent it bounding over the streak of tape, three watches registered 2:11 1-5, and this remained as the best performance of the day.

In the free-for-all the Daimler was content with lesser speed—2:16 1-5—and Church gave up his seat in the car to the mechanic, grimly saying that he did not want to destroy the impressions of the other ride.

Next to the car from England, the best upward traveler was the new six-cylinder Stevens-Duryea, which had toured 400 odd



STEVENS-DURYEA "BIG 6" FROM CHICOPEE TO WILKES-BARRE.

miles from Springfield, Mass., to Wilkes-Barre, carrying C. C. Hildebrandt, the sales manager of the company; G. T. Thompson and M. E. Brigham, the Philadelphia agents; and S. H. Hancock presiding at the wheel. The "Big Six" had one fruitless journey to the top, when a rush of incidents at the bottom of the mountain interfered with a prompt signal to the clockers at the summit. The journey was a rattling good one, and the figures could not have been far away from those of the foreigner. and Hildebrandt could be pardoned for the disappointment which he felt at the failure to obtain official clocking. Later in the day, when the weather reports from the top read "colder, accompanied by snow flurries, bonfires being started," the condition of the un-



'T WAS EASIER COMING DOWN THAN 'T WAS GOING UP.

certain path was more or less slippery and harder to ascend. The "Big Six" did the climb in 2:27, and thus landed a winner of the event for stock cars costing \$5,000 and under.

Herbert Bitner successfully tried out a 35-horsepower Rambler, gained the summit in 3:18 1-5, and took the gold medal for the class for cars costing from \$2,600 to \$3,600.

Charles Soules, a Pope-Toledo driver of reputation, did the trip with a 24-horsepower car of that make in 2:56 4-5, which gave him first place in the \$2,500 and under class.

H. J. Koehler had more fun than anyone else—or at least he seemed to—for he climbed the hill incessantly, landed two gold medals and incidentally appropriated a silver one. His Buick was in good fettle and responded whenever called upon.

C. W. Kelsey made a good run with the four-cylinder Maxwell, his trip occupying 3:04 3-5.

Of course there were disappointed ones, and several cars landed



KOEHLER AND HIS ENERGETIC BUICK, WHICH WON TWICE.

The Wilkes-Barre Automobile Club may feel satisfied with its first attempt, and the 1907 event should be even more successful as a result of the experience gained. The fact that the Centennial Jubilee of the city was in progress made it difficult to obtain proper policing, and of the thousands who were scattered from base to summit many insisted upon occupying the course until the cars literally plowed their way through. Small boys and small girls were particularly numerous, and ultimately the few guardians of the road gave up in despair and prayed that none would be killed. Their prayers were answered, but the next time there should be more police and yards of rope.

While the skill of the driver unquestionably figured in marked manner with insuring success in the Wilkes-Barre event, the fact remains, if one accepts as logical the comments of several whose



CHARLES SOULES AND POPE-TOLEDO CARRYING NUMBER "23."

in the gullies alongside the road, but happily neither drivers nor over-anxious onlookers were injured. The 60-horsepower Matheson, with Mongini in charge, was one of the unfortunates which never reached the top, though he was going great guns when he came to grief on the difficult Devil's Elbow. Ray Owen was progressing heavenwards in fine style when the spark terminal became disconnected and his Reo came to a halt. A Stanley steamer had a brief and inglorious career, joining the has-been class before going a quarter of the way.

The Darracq winner of the Vanderbilt Cup was to have been a participant, but the run by road from New York City gave the car such a shaking that it arrived at the scene in unclimbable plight. Its gears were out of kilter and brakes none too good.



A MAXWELL TACKLING THE RISE OF PROSPECT ROCK.

interest traced back to the making of the cars, that there should be a more varied classification. For instance, the matter of price left much to be desired in separating cars into their proper classes, and in many instances a car would be pitted against another of twice its horsepower and even more. Nor does the question of weight answer this condition, according to the expert, and it would seem that ultimately there must be a division based upon price, weight, and horsepower, if all cars are to have a chance of winning in their own classes. The piston displacement idea, in the opinion of many, would prove the most equitable plan, but its adoption can hardly be accomplished unless the N. A. A. M. takes action in the premises.

"According to catalogue" is a stipulation that causes more or less trouble to race meet officials, as Referee S. S. Gorham can attest from his Wilkes-Barre experiences, for many makers do not hold strictly to catalogue conditions, either in selling their prod-



HERBERT BITNER AND 35-HORSEPOWER RAMBLER WINNER.



RAY OWEN IN A REO ROUNDING A DIFFICULT CURVE.

uct and particularly not when it comes to participating in competition. The desire to win is uppermost, or else no one would engage in competition, but the rules for automobile events require constant amendment to meet the new necessities that arise as improvement is made in motor-driven vehicles. Precedents exist in small quantity, and even then quickly become obsolete through later developments. Automobile competition is never likely to be thoroughly satisfactory to any except the winners, but the events held all tend to add to the general volume accentuating



KELSEY IN 4-CYLINDER MAXWELL



E. C. JOHNSON DRIVING WHITE



CHAS. FLEMING IN MAXWELL.



E. F. SCHEUFFLER IN JACKSON.

SUMMARY OF THE CLIMB.

FREE-FOR-ALL RACING AND STRIPPED CARS.

1. English Daimler, 45 h.p.; owner, Decauville Automobile Co.; driver, H. N. Harding 2:16 1-5
2. Maxwell, 36 h.p.; owner, Maxwell-Briscoe Motor Co.; driver, C. W. Kelsey 3:04 3-5

STOCK CARS COSTING \$8,000 AND UNDER.

1. English Daimler, 45 h.p.; owner, Decauville Automobile Co.; driver, H. N. Harding 2:11 1-5
2. Pope-Toledo, 35 h.p.; owner and driver, S. A. Elliott 3:16 3-5
3. Matheson, 40 h.p.; owner, Matheson Motor Co.; driver, C. R. Grueter 3:31 1-5

STOCK CARS COSTING \$5,000 AND UNDER.

1. Stevens-Duryea, 50 h.p.; owner Eastern Automobile Co.; driver, S. H. Hancock 2:27
2. Pope-Toledo, 45 h.p.; owner and driver, Valentine Bliss 3:12
3. Pope-Toledo, 35 h.p.; owner and driver, S. A. Elliot 3:51 4-5
4. Matheson, 24 h.p.; owner, Matheson Motor Co.; driver, F. Lescault 4:05 1-5
5. White, 18 h.p.; owner, P. B. Shaw; driver, E. C. Johnson 5:51 3-5

CARS COSTING FROM \$2,600 TO \$3,600.

1. Rambler, 35 h.p.; owner, T. B. Jeffery & Co.; driver, Herbert Bitner 3:18 1-5
2. Pope-Toledo, 35 h.p.; owner and driver, S. A. Elliot 3:25 3-5
3. Maxwell, 36 h.p.; owner Maxwell-Briscoe Motor Co.; driver, C. W. Kelsey 3:27 1-5
4. Matheson, 24 h.p.; owner, Matheson Motor Co.; driver, Frank Lescault 4:24 1-5

STOCK CARS COSTING \$2,500 AND UNDER.

1. Pope-Toledo, 24 h.p.; owner, Edward Werland; driver, Charles Soules 2:56 4-5
2. Buick, 22 h.p.; owner and driver, H. J. Koehler 3:21 1-5
3. Rambler, 35 h.p.; owner, T. B. Jeffery & Co.; driver Herbert Bitner 3:21 1-5
4. Stoddard-Dayton, 30 h.p.; owner, W. W. Pardee; driver, R. E. Pardee 4:31 2-5
5. White, 18 h.p.; owner, P. B. Shaw; driver, E. C. Johnson 5:06 3-5
6. Maxwell, 10 h.p.; owner Maxwell-Briscoe Motor Co.; driver, Charles Fleming 5:14

STOCK CARS COSTING \$1,500 AND UNDER.

1. Buick, 22 h.p.; owner and driver, H. J. Koehler 3:00 4-5
2. Jackson, 20 h.p.; owner, Jackson Automobile Co.; driver, E. F. Scheuffler 4:49 1-5
3. Maxwell, 19 1-2 h.p.; owner, Maxwell-Briscoe Motor Co.; driver, Charles Fleming 5:25

STOCK CARS COSTING \$1,000 AND UNDER.

1. Buick, 22 h.p.; owner and driver, H. J. Koehler 3:10 2-5

automobiling's advancement and thus serve a good purpose. As the industry ages its pastime features probably will lessen, and ultimately sink into insignificance, though apparently that day is some distance in the future.

The unusual strains required by fast driving, long-distance tours and hill climbs bring out the weak points in construction, and a car which can stand these extraordinary demands invariably meets ordinary conditions. Therefore, even with rules not thoroughly satisfactory, contests will survive for the present.



MONGINI AND THE BIG MATHESON.



DESIGNER GREUTER—MR. MATHESON



SMALL BOY AND SISTER PROMINENT AMONG THE SPECTATORS.

SUGGESTIONS FOR THOSE WHO DRIVE CARS

Many Advantages of Having a Reserve Battery.

Very often it is inconvenient, say, when one is running in the streets of a city, to stop the car and set right a case of backfiring or misfiring in one of the cylinders of a motor. Many times the trouble can be remedied without the driver leaving his seat, provided the car is equipped with two sets of batteries, separately wired. Backfiring and missing of explosions is not always caused by weak batteries, but in the great majority of cases it can be remedied by switching from the set of batteries that has been in use, to another set, and if you have the extra set wired up and ready for use, many inconvenient stoppages of an automobile in crowded streets may be avoided. It frequently happens, also, that one cylinder will cease firing for the reason that a weakened battery only supplies enough current to move the vibrator and fire the plugs on the cylinders that are in best condition. In cases of this kind the dead cylinder can often be brought to life by throwing on an active battery, without the annoyance of stoppage and delay. The point we desire to emphasize here, is the advisability of always having an extra set of batteries wired up and ready for use, so by a single throw of a two-point switch you can change the ignition from one set to the other without leaving the driver's seat. It takes but little time and trouble to perfect a system of this nature, and the advantages gained are so self-evident that they are at once apparent to the automobilist's common sense.

On the Proper Method of Handling Gears.

Many drivers make the mistake of being too impatient in making changes of gear from high to low. They do not allow the fixed gears to slow down sufficiently before moving the change-speed lever from one notch to another. It is the best practice to declutch, and wait for a second or two before putting the gears into mesh, as this allows the stationary gears to slide without making a noise, and without chipping the teeth. Some clutches are fitted with a brake which begins to act on the withdrawal of the male cone, and this slows down the revolving train of gears, but this brake is not necessary if the operator uses reasonable care. In making the change from a low gear to a high one, the pause above noted is not necessary, as both trains of gears are revolving. Sometimes it facilitates changing to a lower gear to let in the clutch gently while the speed lever is being manipulated. In the handling of gears so much depends upon the art of the driver, that a hard and fast rule is scarcely applicable to the case, but a broad application of the above hints will mitigate the clattering of gears to a large extent, provided they are all right in every other way and properly lubricated, and the satisfaction of having people consider you an able driver should prompt the experiment.

Ground Wiring vs. Two Pole Plugs.

A correspondent in *English Motoring* asks why no better method exists of wiring an automobile than that ordinarily adopted of connecting the ground wire or earth pole to the nearest metal part of the car, and he thinks that many short-circuits are thereby caused. It is obvious that connecting a live wire to the frame is not the ideal method, according to our contemporary's views, as expressed in answer to the inquiry, which goes on to say that "with the high-tension current in the frame of the car short-circuits are of more frequent occurrence than would be the case with a two-pole plug. This latter system has, however, the disadvantage of the multiplicity of wires necessary for a four-cylinder engine. A two-pole plug, with knife switches at the terminals, would form an excellent system. Dirt and oil between the nuts and bolts connecting up the engine to the frame are fruitful sources of bad contact in the 'earth' system now adopted."

The Interesting Problem of Wheel Movement.

Lay a pencil across the palm of the left hand just forward of the wrist, place the finger tips of the right hand upon it, and roll it forward the length of the left hand; the right hand will have advanced twice that distance, and the result will be the same with a roller of any diameter, for the reason that the constantly changing part of the pencil in contact with the right hand has twice the forward velocity of the center, says *English Motor*. Therefore, if an automobile be traveling at, say, twenty miles an hour—paradoxical as it may seem—an ever-changing point in the wheel is traveling onward at the rate of forty miles per hour. Another application which may interest the lay mind is to be found in the differential gear. Cast off the driving chains—if a chain-driven car—lash one sprocket to a stanchion, then turn the differential box one revolution by hand and the free sprocket will make two revolutions for the reasons above noted. The problem of wheel movement is as old as the hills, but it never loses its interest to the student of geometry.

How Automobilists May Keep Their Watches Clean.

It frequently happens, especially during long tours, that automobilists are troubled with accumulation of fine dust and grit that finds its way in some manner to the working parts of their watches. A good way to avoid this annoyance is to open the front case of the watch, and with a match, cut chisel-shaped at one end, apply a thin coat of vaseline all about the seat of the case where the lid fits. When this is done treat the back lid of the case in the same manner. Only a small quantity of vaseline is required, just enough to make an unbroken film of it all the way round, and it will make the watch dustproof and waterproof at these points. At the end of a month or six weeks open the cases and you will be surprised at the amount of dirt that has collected at the edges of the case. This removed, the treatment as outlined above can be repeated.

Starting Single-Cylinder Car from Spark.

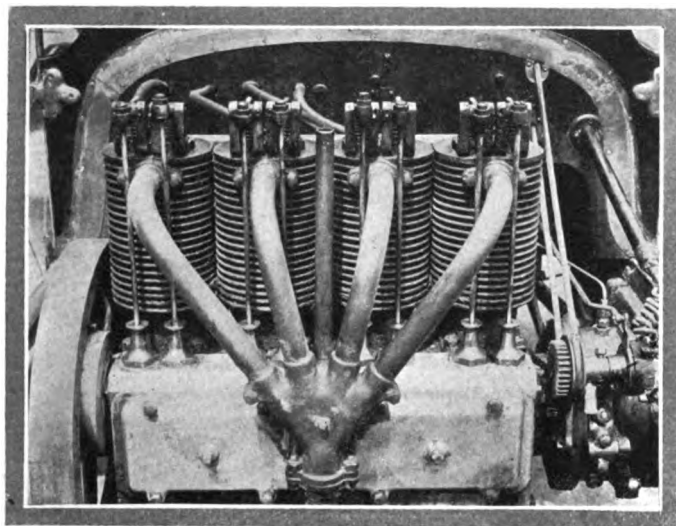
J. Clarence Thomas, Corsicana, Tex., writes that he has been experimenting with starting the motor from the spark with good results. He says: "I have a runabout of the curved dash variety, and I adjusted the coil vibrator so as to get a good hot spark every time. I then set the contact, so as to fire just over the center, put in good fresh batteries, then put engine in first-class shape, so as to have good compression. This car has only one cylinder, so when I say I start every time with the spark you will see that is something new. When the engine has been running, I turn it over until the piston is just over the compression stroke, after which I switch on the spark and it goes every time. This will only work on an engine having good compression. My eight-year-old son starts this car that way, so you see the plan will work."

Anti-Skids Should Be Used in Pairs.

Should the back wheels of a live-axle car develop a grinding noise, the first thing to do, of course, is to investigate the lubrication. If this is all right and the noise continues, the trouble is a puzzling one. However, this trouble is not apt to develop unless there is some difference in the size of the tires on the rear wheels. Some automobilists fit one of the rear wheels with an anti-skid device, which is a mistake, as it makes the diameter of one of the driving wheels larger than the other, and causes the differential to be continuously at work. It also puts an extra strain on it in starting or in the application of brakes, as the wheel fitted with the anti-skid has a sharper bite on the roadbed. Anti-skid devices should always be applied to tires in pairs. The extra cost for the second device is much cheaper than a new set of differential gears.

MOTORS THAT WON IN THE TWO-GALLON TEST

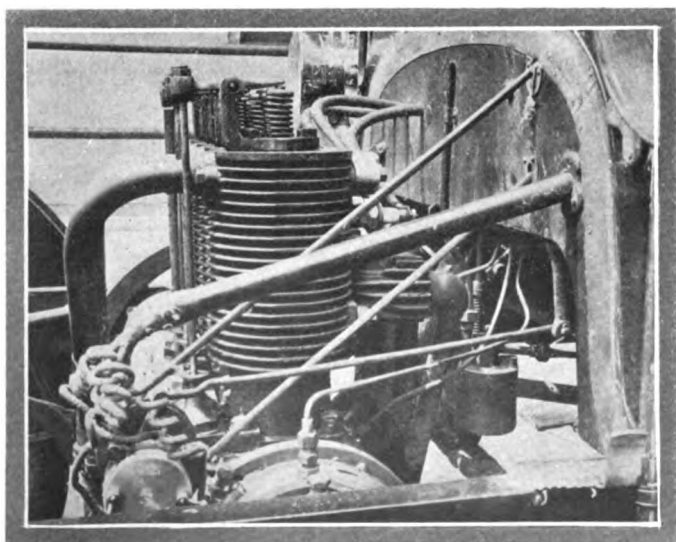
IN view of the very economical runs made by the air-cooled machines that took first and second places in the Two-gallon Efficiency Contest promoted by the Automobile Club of America, it is interesting to note some of the mechanical details of the cars, which represent two different types of American air-



FRANKLIN MOTOR, SHOWING MAIN EXHAUST PIPES.

cooled automobiles. The Franklin, which won first place, is a light runabout with four vertical cylinders cooled by natural air drafts; while the Frayer-Miller car, which scored second place, is a full touring car, also with a four cylinder vertical engine, set in the usual fore and aft position, but the cylinders are cooled by a forced blast of air. Both cars are regular stock models, and both were driven by experts who are not only adept drivers, but who know every detail of their machines.

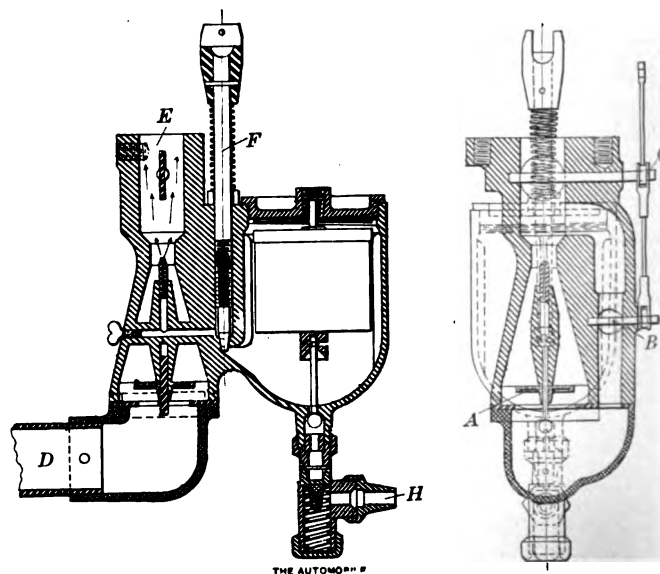
The Franklin car, which traveled 87 miles, scored 200,100 points and won the first prize, is a 12-horsepower four-cylinder runabout of the Franklin 1905 model, with the engine placed in



CARBURETER AND AUXILIARY EXHAUST ON FRANKLIN.

front, transversely, driving through a planetary transmission and a long chain to the live rear axle. The car is a very light one, weighing 1,100 pounds, according to the catalogue rating, and the running weight, with two passengers on board, was shown by

the official scales to be 1,500 pounds. Both front and rear wheels run on roller bearings. Previous to the contest the car was placed in the hands of Arthur Holmes, an expert from the Franklin factory, and was tuned up to the highest possible pitch of efficiency. The gasoline tank was slightly tilted to cause all the gasoline to drain into the carbureter, but, the New York agents state, no other changes were made. The 1905 engine is exactly the same as the 1906 engine in every detail, the only changes made in the car for the current season being of a minor character, such as the lubricator and the timer. During the contest the car, of course, was driven with extreme care, the high speed being used throughout the run. Advantage was taken of every opportunity to coast down grades, with the engine shut off, and a good deal of coasting was done on level ground, the car being run up to a fairly high speed and then allowed to run under the influence of its momentum until moving quite slowly, when the engine would be again thrown in. The light weight of the car permitted picking up speed without using much fuel. With the



CROSS SECTION FRANKLIN AUTOMATIC CARBURETER.

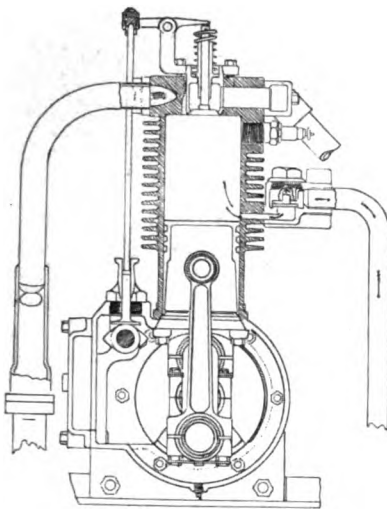
spark advanced as far as road conditions would permit and the throttle open as little as possible, Holmes drove his car to victory.

Some of the Franklin's Mechanical Points.

The Franklin motor is designed with a view to giving the easiest possible ingress and egress to the gases, the valves, placed directly in the head of each cylinder, being as large as the diameter of the head will permit. In addition there is an auxiliary exhaust valve which carries away the greater part of the hot gases and has an important influence on the cooling of the engine. The valves in the head are mechanically operated from a single camshaft, there being two cams for each cylinder. The auxiliary exhaust port, cut through the wall of the cylinder, is opened by the piston during the latter part of its stroke. A check valve in the exhaust passage opens to permit the escape of the exhaust, but remains closed when the piston uncovers the port at the bottom of the intake stroke. Natural air drafts are relied upon to cool the cylinders, no fans being used.

The Franklin carbureter is made on the usual float-feed plan, but presents interesting modifications of the usual type and is considered by the manufacturers to be exceedingly efficient. There are two air inlets, as shown in the accompanying drawing; one, at A, is normally held on its seat by a spring, and is lifted by the suction of the piston to admit air. The other, at B, is connected

with the throttle lever *C*, so that as the throttle is opened the air valve is opened at the same time and in the same proportion, the spring-controlled valve maintaining the balance of proportions automatically.

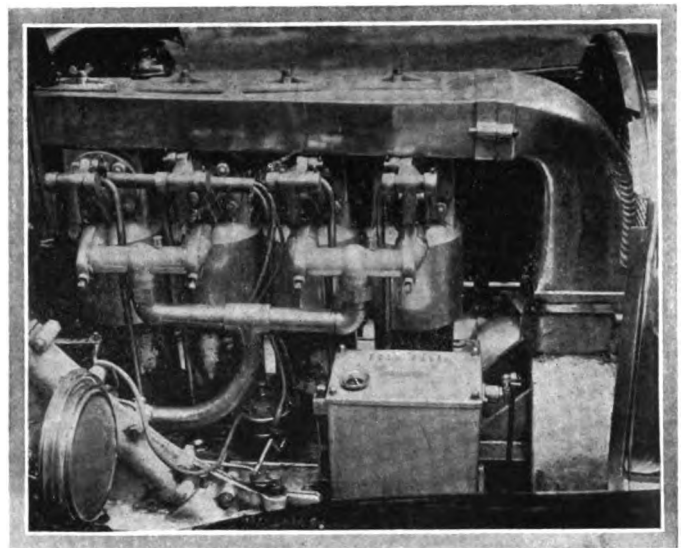


CROSS SECTION FRANKLIN MOTOR.

The air inlet, through which all the air passes, is at *D* and the motor supply pipe is attached at *E*. The needle valve controlling the supply of gasoline to the spray nozzle is at *F*; gasoline enters the float chamber at the bottom, the gasoline pipe connection being at *H*. No governor is used on this car, though the larger Franklin motors are all governed. The gasoline tank used was the regular rectangular tank fitted to the car and placed under the seat; it was slightly tilted, but otherwise unchanged.

Characteristics of the Frayer-Miller.

The Frayer-Miller car that won second place by traveling 47.9 miles on two gallons of gasoline, carrying five passengers, is a regular touring car of the 1906 type, with 24-horsepower motor, and is owned by Dr. Butler, of Brooklyn, N. Y., who loaned it to the Frayer-Miller Company for the contest. Frank Lawwell, who drove the car, is an expert in the employ of the Frayer-Miller Company, and he exercised the greatest care in the manipulation of the throttle. "The carbureter is a very economical one," said Mr. Lawwell. "I took a great deal of pains to see that the motor was given the weakest mixture it would run on, using as much air as possible. I cut down the gasoline and opened the air inlet, gradually weakening the mixture until the engine began to miss explosions, which showed that the charges were too weak to ignite properly. Then I very slightly increased the proportion of gaso-



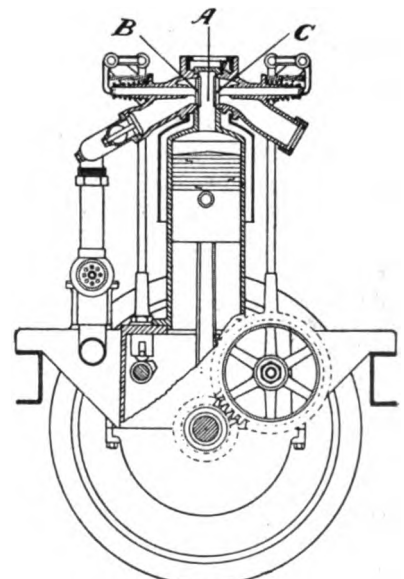
FRAYER-MILLER MOTOR. NOTE BLOWER AND AIR DUCT.

line until the skipping stopped. I watched the carbureter sharply every minute and took advantage of all opportunities to coast without using fuel."

The car was equipped with a special gasoline tank of cylindrical form, secured above the dashboard, as shown in the photograph; one end was raised an inch or two higher than the other, so that the gasoline would all flow to one end of the tank, and the pipe leading to the carbureter was, of course, led out from the low end of the tank. The regular gasoline pipe was disconnected and the pipe from the special tank screwed into the carbureter; apart from this the car was not altered in any way from its regular touring form. With 5 passengers, the car weighed 3,270 pounds.

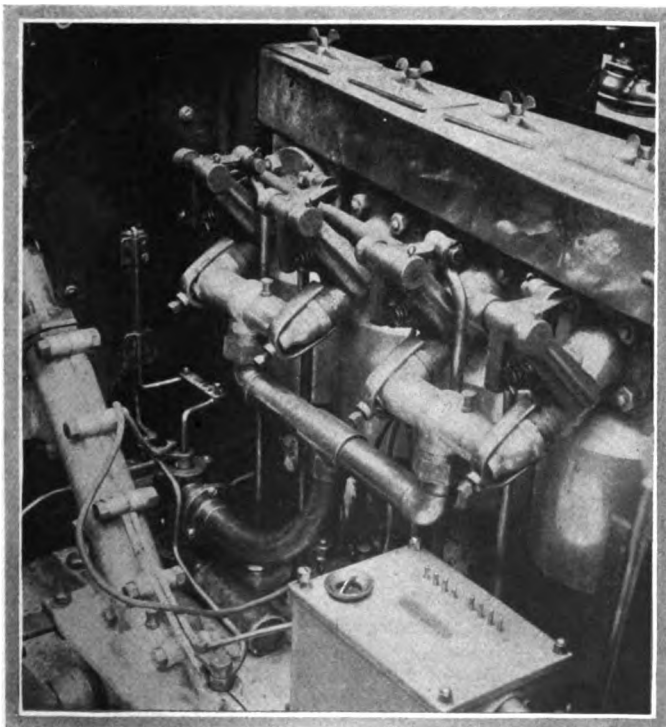
The Frayer-Miller air-cooling system has been described in detail in *THE AUTOMOBILE*, but it may be repeated that the cylinders are surrounded by aluminum jackets open at the bottom and connected at the top to a rectangular aluminum pipe which leads to the jackets air from a fan blower gear-driven from the forward end of the crankshaft. The cooling air is blown directly on the cylinders, and the volume is just sufficient to keep the temperature of the cylinders below the point where the lubricating oil would be burned. Thus the engine is run at the highest possible temperature — a condition which is conducive to economical operation, all the heat units carried away in the cooling system representing just so much wasted energy.

Like most air-cooled engines, the Frayer-Miller engine has its valves arranged with a view to giving the incoming charges and the outgoing exhaust the greatest freedom and directness. Both valves are mechanically operated, and are placed with their stems in a horizontal position, in a narrow pocket formed by an upward extension of the cylinder head. The arrangement



CROSS SECTION FRAYER-MILLER.

is shown clearly in the accompanying drawing; *A* is the valve chamber into which open the inlet valve *B* and the exhaust valve *C*. The valves are each 1.5-8 inches in diameter, the inlet valve



CARBURETER AND FEED PIPE OF THE FRAYER-MILLER.



FRANKLIN AND FRAYER-MILLER PRIZE-WINNING CARS AT THE START OF THEIR REPEATING RUN.

having a lift of 1-4 inch and the exhaust valve a thirty-second more. Both valves are mechanically operated by long push-rods and bell-cranks. The spark-plug is screwed into the top of the valve chamber, so that the sparking points are equidistant from each valve. Here the plug is well out of the way of lubricating oil and is subjected to the scouring action of the gases. The spark plug and the valve chamber are directly in the path of the cold air from the blower, and are kept comparatively cool.

The carbureter, designed by the builders of the car, is of the float-feed type with automatic auxiliary air inlet in addition to a manually controlled air valve. The piping from the carbureter to the inlet valves is so disposed that the gas travels the same distance to each cylinder. No attempt is made to bring the carbureter close to the valves; in fact, the piping is rather long. The exhaust is carried out through a separate pipe for each exhaust valve, all pipes joining a larger pipe which extends to muffler.

A good deal of the credit for the fine performance of the Frayer-Miller is ascribed to the easy running of the machine, ball bearings being freely used. Ball bearings are used throughout the transmission, bevel driving gears and the live rear axle. There are 17 ball bearings in the car.

In both cars ignition is by jump spark and the spark timing, as well as the throttling, is done from the steering wheel in the usual way. In addition to the usual throttle, however, the Frayer-Miller car is regularly fitted with a small lever on the dashboard for regulating the air supply. This was frequently adjusted in the contest.

ASKED TO REPEAT, CARS IMPROVED.

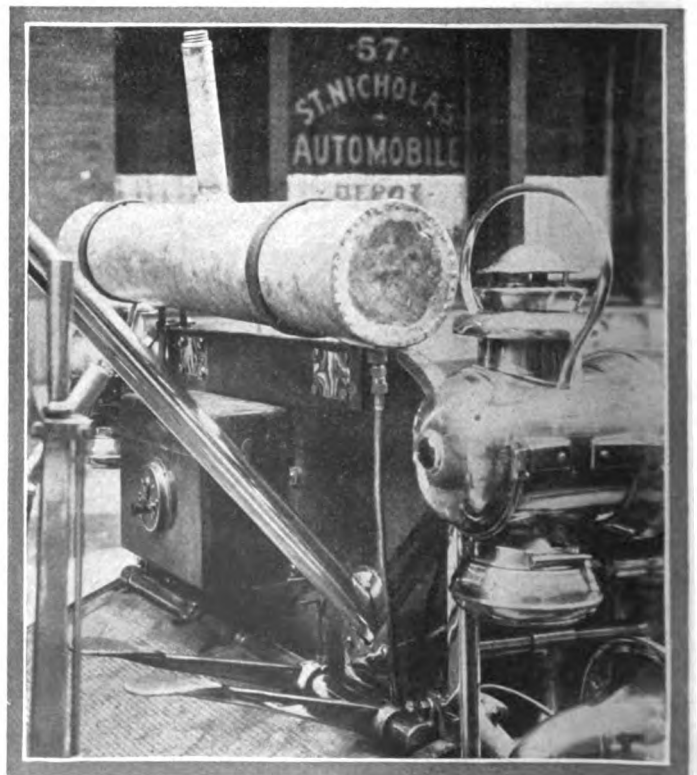
An interesting sequel to the two-gallon contest was the re-running of the course by the Franklin that finished first in points in the actual contest, and the Frayer-Miller car that took second place. The remarkable performances brought forth a great deal of comment, favorable and otherwise, and in order to terminate all this the cars were asked to repeat the performance under conditions similar to those of the original event. On the following Tuesday afternoon, therefore, the Franklin and the Frayer-Miller were weighed in at the scales used on the previous Saturday, found to be of the same weight, with their passengers, as in the contest, and were sent away with the officially measured two gallons in their tanks.

Fortunately, Saturday's weather conditions were not duplicated, and the roads were excellent. Though the Franklin got off the road and lost something thereby, a distance of no less than 94.5 miles was covered before the fuel failed, while the Frayer-Miller car made 59.8 miles. In the case of the Franklin the distance covered was eight miles more than in the actual contest and the points made, according to the formula, totaled 218,500, or 18,400 points more than in the contest. The Frayer-Miller car exceeded its first run by 11.9 miles and made a score of 243,386 points, or 48,433 points more than on Saturday and 24,886 points more than the Franklin's score for the second run. The

figures resulting from the second run, of course, had no effect on the scores made in the contest.

WINNERS RECEIVE THEIR PRIZE CUPS.

Before an interested assemblage Monday night at the Automobile Club of America the cup winners received their prizes. E. S. Partridge, of the Decauville Automobile Company, received the gold cup won by the Franklin, and Dr. Samuel B. Butler, the Frayer-Miller entrant, accepted the silver cup. S. B. Stevens, owner of the Darracq, was absent, and the silver medal was placed in the keeping of Secretary Butler. The presentations were made by Dr. Wheeler, the chairman of the Contest Committee, after the meeting had been called to order by President Morris. Much amusement was caused when Dr. Wheeler stated that an engineer had carefully calculated that there were not enough heat units in two gallons of gasoline to have propelled the cars the distance with which they were credited. Dr. Wheeler said that, in view of the information obtained from the contest, the single-cylinder and double-cylinder cars would not be so heavily handicapped another time.



SPECIALLY FITTED TANK ON THE FRAYER-MILLER.

ANALYTICAL RESULT OF A. C. A. EFFICIENCY TEST

MANY interesting deductions appear upon analysis of the results of the A. C. A. Two-gallon Efficiency Test held on Saturday, May 5. It is only when the aggregate figures are taken that one can get a fair realization of the immense amount of work done in the test and the actual fuel economy of it. Here are the totals figured from the club's official data sheet:

Number of cars that finished.....	62
Number of passengers carried.....	275
Aggregate of miles traveled.....	2,321.31
Aggregate tons transported.....	95.11
Gallons of gasoline consumed.....	124
Cost of fuel at 20c. a gallon.....	\$44.88

From this it is found that the average number of miles traveled per car on a consumption of two gallons was 37.44—a distance certainly in excess of what was expected. It is also seen that a load of more than 95 tons (representing aggregate-weight of cars and passengers) was moved a mean distance of 37.44 miles at a cost of \$44.88, or approximately \$1.20 a mile. Unfortunately, there are no reliable figures whereby the actual weight of the passengers can be arrived at. It should be remembered, in making comparisons, that no account has been taken of the consumption of lubricating oil, of wear on tires, of drivers' time, and of general wear and tear of the cars. It is merely an interesting showing of the present efficiency of the automobile engine and transmission mechanism.

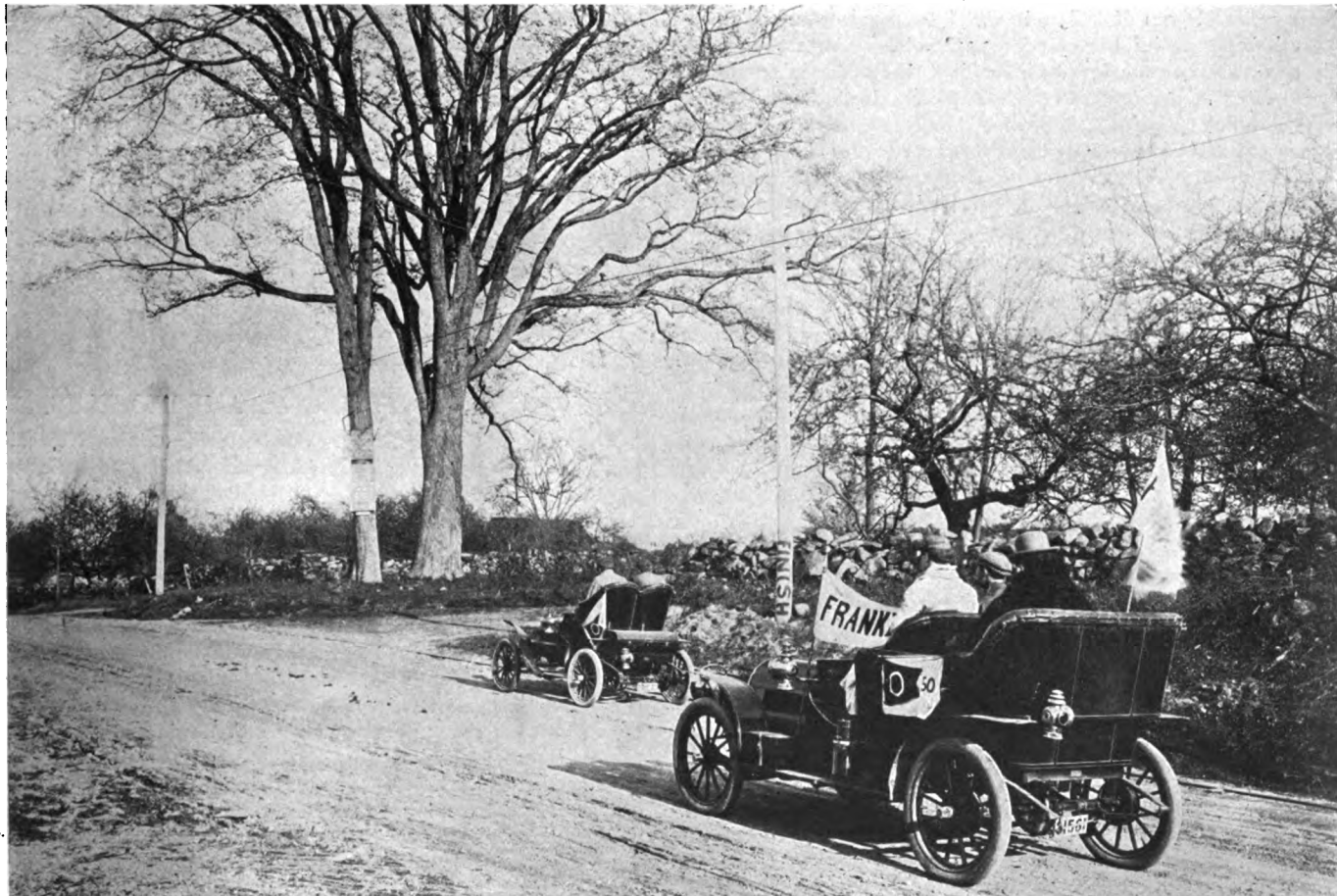
But it should be noted that the experimental formula adopted

by the contest committee for determining relative merit of performances is based on the total load moved as represented by car and passengers weighed together and not on the weight of the passengers alone multiplied by the distance traveled. For this reason the results show mechanical efficiency rather than the efficiency of the cars as vehicles. Of two cars carrying the same number of passengers and traveling the same distance, the heavy one is bound to win, although for weight carried in proportion to weight of vehicle, the light car does the work on a smaller original investment and smaller cost of up-keep. For example: Take two four-cylinder cars weighing respectively 2,300 and 4,000 pounds and add to each the 800 pounds "handicap" (a constant) provided by the formula, and we have respectively the multiples 3,100 and 4,800. These multiplied by 40, the number of miles we will assume both cars traveled, and we have a score of 124,000 for the light car and 192,000 for the heavy car, although both carried five passengers the same distance. Magnified to an extreme, a car of 4,000 pounds gross weight, built so heavy and operating with such frictional losses that it could just carry two persons twenty miles, would outscore a car of 2,500 pounds gross weight that carried five passengers twenty-five miles. It works out thus: $4,000 + 800 \times 20 = 96,000$, and $2,500 + 800 \times 25 = 82,500$. Thus, when the dead weight of the car plus the weight of the passengers is taken as a multiple, a premium is put on heavy construction.

When the formula is ignored, and the performances are worked



HOLMES, WINNING DRIVER.



THE WINNING FRANKLIN IS JUST PASSING THE MISPLACED "FINISH" 50-MILE POST ON THE RE-RUN OVER THE COURSE.

out in ton-miles and passenger-miles, as in the following table, some interesting results are shown:

Table of Results by Ton-Miles and Passenger-Miles.

Order of Winning.	Name of Car.	Points Awarded.	H. P.	Ton-miles.	Coat per Ton-mile, Cents.	Passenger-miles.	*Coat per Passenger-mile, cents.	Cylinders.	Cool.
1	Franklin	200,100	12	65.25	.613	174.0	.287	4	air
2	Frayer-Miller	194,953	24	78.315	.51	239.5	.167	4	air
3	Darracq	181,580	15-20	72.21	.553	232.2	.178	4	water
4	Mack	173,441	40-50	79.868	.50	840.0	.048	4	water
5	Compound	149,422	16	57.31	.697	217.5	.183	3	water
6	Orient Buckb'd.	143,358	4	45.955	.87	197.66	.203	1	air
7	Frayer-Miller	142,737	36	59.6	.671	205.8	.194	6	air
8	Cadillac	131,812	10	63.437	.64	222.0	.18	1	water
9	White Steamer	108,512	18-20	43.872	.911	129.8	.385	2	condenser
10	Maxwell	100,107	16	47.533	.841	180.0	.222	2	water

*Figured on the basis of two gallons of gasoline at 20 cents a gallon.

From this it will be seen that when the distance traveled is multiplied by the weight and by the number of passengers carried, the best performance was made by the huge Mack observation wagon, which went 17.13 miles as against 87 miles covered by the winning Franklin, the 10,125 pounds of the sightseeing car overbalancing everything else. It was, however, a remarkable performance, especially with regard to passenger-mile economy.

The way in which the constant of 800 pounds added to the gross weight of each car in accordance with the formula works to the advantage of the light car is shown in the case of the first and second cars. Although in ton-mile and passenger-mile performance the four-cylinder Frayer-Miller made the best showing of all the touring cars, the Franklin took first place in number of points scored. On the other hand, this advantage is more than offset in the case of one and two-cylinder cars by the handicap put on them by the formula, which provided that they should be rated at only 70 and 75 per cent. of their actual loaded weights respectively. For instance, the Orient buckboard, which made a most creditable run of 98.83 miles with two passengers, won only twentieth place with a score of 143,358 points; but, if figured on the same basis as the four-cylinder cars that took the first nineteen places in the contest, it would have gained 180,975 points, which would put it in fourth place. With the exception of the tri-car, which was not competing for a prize, the buckboard ran farther on its two gallons than any other car in the trials, outdistancing by nearly 23 miles the winning car, which also carried two passengers, its single cylinder and light weight giving the buckboard a great advantage in fuel economy.

Again, the highest place taken by any two-cylinder car was fiftieth position, won by the 16-horsepower Maxwell, carrying five passengers. This ran 36 miles, and its performance to many would seem to be as meritorious as those, for instance, of the Renault 14-horsepower brougham, which carried three persons 36.61 miles, and the 20-32-horsepower Darracq, that carried four persons 34.62 miles, and won respectively tenth and eleventh places. Apparently the only reason for its being so far down the list is because it is not heavy enough and does not have enough cylinders for a contest of this sort.

Probably from a users' standpoint the Oldsmobile single-cylinder runabout that carried two passengers 45 1-2 miles is entitled to a better position than fifty-ninth, when a high-priced four-cylinder Mors that went only 15.72 miles took the place ahead of it. From this viewpoint also the little two-passenger single-cylinder Covert, that got 73.75 miles on the way to Boston through the rain also has more to its credit than appears from its official position of thirty-ninth.

Factors that were not taken into account at all by the committee will have weight with students of the results—such as price, probable tire and upkeep expense, and horsepower. They will be concerned mainly with the relative efficiency and economy as between cars of the same type and approximate cost.

Certainly the novelty of the contest was keenly appreciated, for an unusual amount of interest was taken in it, and this shows that

the automobilists are eager for technical competitions, having outgrown the mere endurance or reliability run. Never in this country have there been so few non-starters in any sort of competition—only six out of seventy-one entries. The entry list was unexpectedly large for an event so little advertised, and the number of contestants who withdrew or failed to finish was remarkably small—only two, in fact: the Frayer-Miller, which broke a wheel against a car track after running several miles with a tire off, and a Panhard that stopped with an overheated engine.

So great has the rivalry over the question of efficiency been since the conclusion of the event, that even after the committee had conducted a run-over of the trial by the winners of first and second places, one of the two contestants has made a proposal to hold another test under similar conditions.

PARIS AUTOMOBILE STRIKE VIRTUALLY ENDED.

A cable from Paris conveys the information that the strike is virtually at an end as far as it concerns the automobile industry, nearly all the concerns having resumed work. The coach-building industry has not renewed its normal conditions, but it is expected that such will be the case in the next day or so.

CHAIRMAN FOR A. A. A. HIGHWAYS COMMITTEE.

Robert P. Hooper, of the Automobile Club of Germantown, has been appointed chairman of the Highways Committee of the American Automobile Association, President John Farson having made the announcement from Chicago. Mr. Hooper is an enthusiast who may be depended upon to do energetic work as the head of what many consider the most important committee of the national organization.

The Highways Committee, if the wishes of President Farson are carried out, will accomplish much in molding sentiment in favor of government aid in roads building.

RECENT RACING AT KANSAS CITY.

KANSAS CITY, Mo., May 14.—This city witnessed some good automobile contests May 9, at Elm Ridge track. The star attraction was, of course, Barney Oldfield and his Peerless Green Dragon. As usual, he defeated Paul Albert in the five-mile match race, but was unsuccessful in his attempt to lower mile record. Dallas McFall, in a Stevens-Duryea, won three races, the fifty-mile open for touring cars, and the two five-mile events for cars listing from \$1,800 to \$2,500, and \$2,500 or over. The five-mile for cars listing at \$1,000 or under was won by H. G. Kirkland, in a Buick, and the five-mile handicap went to J. H. Wittman, in a Pope-Toledo, from scratch.

LIVERYMEN PUTTING IN AUTOMOBILES.

NEW HAVEN, CONN., May 7.—Further evidence that New Haven is beginning to "catch on" as an automobiling town is supplied by the recent action of Frank N. Palmer, of Crown street, one of the largest liverymen in the city, who has recently installed a system of autos in his stables which will be rented. Mr. Palmer recently purchased three new 1906 touring cars. One of the new machines is a handsome blue four-cylinder Rambler, another is a four-cylinder Pope-Hartford, and the third is a two-cylinder Ford car. Two other livery firms which have recently adopted automobiles as part of their equipment are George C. Nesbit, of George street, and Kinney Bros., of Congress avenue. Mr. Nesbit has two 12-horsepower Buick touring cars, and Kinney Bros. recently installed one of the latest model Knox air-cooled touring cars. All three machines are given excellent satisfaction and reaping a harvest for their owners.

When asked if the popularity of the automobile had injured the livery business to any great extent, Mr. Palmer stated that it most certainly had, and that there would be little or no renting of livery outfits in the near future.

WHY OHIO'S LAW IS UNCONSTITUTIONAL

COLUMBUS, O., May 14.—Secretary of State Laylin is sending out a circular to automobile owners all over the state, informing them of the ruling of Attorney-General Wade H. Ellis, that the new auto law is invalid, and that he will not enforce it unless the courts pronounce it sound. The letter follows:

Dear Sir:—

I am advised by the Attorney-General that the act of April 2, 1906, requiring registration of motor-vehicles in this Department, and obtaining license to operate same, is unconstitutional for the following reasons:

1. It is not uniform in its operations.
2. It deprives municipalities of the power to regulate the use of its streets as to a certain class of vehicles.
3. Its provisions are indefinite and uncertain.

I am also advised by him not to incur further liability, nor to take other official action thereunder until this act is construed, or its validity determined by a court of competent jurisdiction. The Secretary of State will be governed by the foregoing advice of the Attorney-General.

Yours respectfully,

LEWIS C. LAYLIN,
Secretary of State.

A suit to test the Sawicki law will be filed in the Supreme Court this week as a result of a conference of Attorney-General Wade H. Ellis and the officials of the Ohio State Automobile Association of the A. A. A. The suit is a friendly one to determine the status of the law, and will be filed by Attorney Cushing, of Cincinnati, representing the Cincinnati and Cleveland clubs and the state organization.

Cleveland Returns to Its City Ordinance.

CLEVELAND, May 14.—Because of the ruling of the Attorney-General the Cleveland authorities have decided to return to the enforcement of the city automobile ordinances heretofore in vogue, and they have notified automobilists of this city that, after May 16, all cars must be fitted with the Cleveland license tags. During the time that the old Cleveland ordinance was out of force a great many of the automobilists removed their numbers and wholly disregarded the speed ordinances, knowing that the Cleveland police had instructions not to make arrests for violations of the local ordinances. This resulted in an unprecedented number of accidents. Several of these proved very serious and culminated in one fatal accident.

A large number of accidents caused by youthful and inexperienced operators has determined the city authorities to institute some kind of a measure requiring registration and examination of all chauffeurs as to their ability to operate machines. The Cleveland Automobile Club has gone on record as being in favor of such a measure. Speaking of this measure, Secretary Goddard says:

"There is no question but what all operators of automobiles should be compelled to pass an examination before being allowed out on the street. Every stationary engineer handling even an isolated plant where there is comparatively little danger to the general public is compelled to pass a rigid examination and to have his license conspicuously posted. An automobile capable of anywhere from 30 to 60 miles an hour is immensely more dangerous to the public than any stationary engine. The examinations for certificates to handle a machine should not only insure that the operator is thoroughly familiar with the handling of his machine, but a person who is nearsighted, or even color-blind, should not be permitted to operate on the streets, and no irresponsible minor or child should be allowed to handle a machine unattended by an adult operator.

A committee composed of W. E. Baker, Charles B. Shanks, Vernon Burke, and Mr. Goddard has been appointed to draw up an ordinance covering these points, and the city authorities have agreed to consider their recommendations before taking action. The park authorities are not satisfied with the ordinance in

force in the city, and Chief Goldsoll, of the park police force, is getting up an ordinance on his own account which he will endeavor to have placed in force in the parks and boulevard systems. His plan is to sectionalize the entire park and boulevard system and post conspicuous signs indicating what the speed limit is for that section.

The park authorities have been remarkably lenient in the treatment of automobilists in the past. Last year there were some 400 complaints against speeding in the parks and only one arrest and conviction of an offender. Now the chief has changed his tactics and is going after offenders with a vigorous hand. He proposes to mount a portion of his force either on horses or motor bicycles.

Last week Chief Goldsoll had a discussion with Secretary Goddard, who told the chief that a speed of twenty miles an hour would be perfectly safe on outlying portions of the boulevard system. He offered to take the chief for a ride through the boulevard system, and demonstrate that a car traveling at this speed could be stopped within 15 to 25 feet. The chief said that if this could be done he would have no objections to such a speed on certain portions of the system, and the interesting demonstration will be made in a few days, which will no doubt substantiate the reasonable claims of the enterprising secretary.

A POSSIBLE TANGLE IN MASSACHUSETTS.

BOSTON, May 14.—The Massachusetts Highway Commission is facing a serious dilemma as the result of a decision made this week by a municipal court judge in Boston. The case was that of an operator who was arrested on the charge of having only one number plate on his car, the rules of the Highway Commission requiring two, one in front and the other in the rear. When the case came up for trial the attorney for the accused put in as a defense that the rules of the Highway Commission were invalid, because the commission had not passed a regulation requiring two number plates. Secretary Fletcher, of the commission, was put on the witness stand, and testified that August 20, 1903, the commission voted that a "form of certificate" be approved, and the attempt was made to prove that this vote included the rules and regulations printed in the certificate. The Court sustained the contention of the counsel for the defendant, that to approve a form of certificate is not passing rules and regulations, and the defendant was discharged.

As the rules and regulations of the commission comprehend practically all the regulations under which automobiles are operated, except the requirements of the statutes, the decision is a very serious matter. More than 13,000 automobiles are being operated in this State under the registration certificates issued by the commission, and if these were nullified it would lead to very serious complications. As soon as the decision was made known the commission held a special meeting and formally adopted its rules by vote, but the question now arises if this action is retroactive and affects the certificates that are now issued.

The Commissioners will not carry up the present case, nor will they appeal to the Legislature, for they believe that, though this case has gone against them, their regulations as they stand will be upheld in a majority of instances. Furthermore, a bill has just been passed by the Legislature and signed by the Governor which, when it goes into effect the first of next month, will give the commission power to make such rules and regulations as it deems necessary. At that time the present set of rules will be revised and new regulations issued. The commission is hoping that it will not be driven to drastic action, but if it finds that many parties are escaping punishment under the technicality, it is possible to revoke all of the 13,000 certificates and issue new ones containing new regulations.

ONTARIO'S RESTRICTIVE AUTOMOBILE LAW.

TORONTO, ONT., May 14.—A new act has just been passed by the Legislature of Ontario that imposes still more stringent regulations on the automobilists of this province. It provides, among other things, that the permit numbers, five inches in length, shall be displayed on the front as well as the back of the vehicle, and shall be kept clean. No other number than that issued by the Provincial Secretary shall be carried. Provision is made for the proper illuminating of the numbers at night.

Persons in charge of motor vehicles are to use reasonable precaution not to frighten horses, and to stop on the signal of a rider or driver of a horse when meeting such. If a horse appears to be frightened the owner or occupants of the automobile shall, if requested, render such assistance to the rider or driver as is necessary. No motor vehicle shall carry a lamp which is regarded by the trade as a searchlight. In the case of an accident to any person "owing to the presence of any motor vehicle on any public highway," the person in charge of the motor vehicle shall return to the scene of the accident and give in writing to anyone demanding the same his own and the name and address of the owner of the vehicle. When loss or damage is sustained by any person by a motor vehicle the onus of proof that it did not arise through the negligence of the owner or driver shall be upon either of the latter.

For failure to obey regulations regarding figures, for racing on a bet or wager on any public road or street, and for failure to obey the regulations as to conduct in case of accidents, it is provided that persons shall be liable to a fine for the first offence of \$50; for the second offence, \$100; and on conviction of a third offence shall be liable to not more than one month's imprisonment. If there are three convictions within a calendar year, the permit of the vehicle shall be canceled, and the offender shall not be entitled to a permit under the act for a period of two years thereafter. For violation of regulations where the penalties mentioned do not apply, offenders shall be liable to fines of not less than \$10 and not more than \$25.

Every peace officer may make arrests of violators of the regulations without warrants, and in some cases may make such arrests, where "on reasonable and probable grounds" he believes an offence has been committed, whether it has been committed or not, and whether such person is guilty or not. Anyone is empowered to make arrests for violation of the more important regulations of the new automobile law.

TWELVE MILES AN HOUR IN BALTIMORE.

BALTIMORE, May 14.—The last general assembly of Maryland passed an automobile bill which apparently increased the speed limit in the city of Baltimore from six to twelve miles an hour. Automobilists of the city were, therefore, considerably startled when, not long ago, State's Attorney Albert S. J. Owens delivered to one of the local magistrates an opinion that the rate remained the same. Osborne Yellott, council for the Automobile Club of Maryland, who drew up the bill, differed with Mr. Owens, and it was decided to make a test case of the speed section. Accordingly Mr. Yellott and one or two members of the club informed the officer on duty on Mount Royal avenue, the principal boulevard, that they were going to drive by at a speed considerably in excess of the six miles. This they did and were arrested.

It seems that the trouble lay in the matter of punctuation, Mr. Owens' copy of the bill being entirely different in that respect from the one held by Mr. Yellott, who sent to Annapolis for a true copy of the original, which came to hand in due season. Now the State's Attorney's office announces that it was wrong in its opinion and that the bill did increase the speed to twelve miles per hour. It is probable that the case against Mr. Yellott and his friends will be dropped. Naturally Baltimore automobilists are jubilant, as the decision places them in a position to drive their machines at a reasonable pace inside the city limits.

A CANADIAN JUDGE WISER THAN HE KNOWS.

MONTREAL, May 14.—Berne Nadall, an automobile company manager, was fined \$10 and costs by Recorder Weir for exceeding the six miles an hour prescribed by the city. Mr. Nadall was demonstrating a car to a new purchaser, and claims that he was not going at any excessive rate of speed. The official text of Recorder Weir's remarks in the case are given herewith:

"The weight of evidence in this case is against the defendant. The action is based not upon a city by-law, but upon a statute of the province. It must be clear that automobilists cannot expect to gain much enjoyment by creeping along in the city in their fleet machines at the slow rate of six miles an hour, but the law is enacted for the public safety and must be observed; *Salus populi suprema lex*. In the country the rate of speed must not exceed fifteen miles. The only thing for automobilists to do, who wish to indulge in the pleasurable swift motion of their expensive machines, is to secure rights of rapid passage on some speedway. In the city too rapid transit is certainly dangerous. I say this without an atom of prejudice against motors, which may be, for aught I know, the public vehicle of the very near future. I fine defendant \$10 or one month, although the maximum fine is \$20."

LESSER AND STILL TOO MUCH TOLL ON PIKE.

CAMBRIDGE, O., May 14.—The commissioners of the National Highway have lowered the automobile toll from 5 to 3 cents a mile—that is, after the first trip, when the driver must leave the number of his machine and the owner's address with the toll-gate keepers. The automobilists, according to the *Cambridge Times*, still think the rate is prohibitive. Why, they ask, should they buy high-priced machines and then have it cost more to travel in them than it does on the railroad? But the commissioners reply that automobiles drive other traffic from the pike, and they are not particular about the patronage of automobilists at any price. Nearly \$4,000 of accumulative tolls now in the treasury will be expended on the pike this summer. The system of road toll is becoming a relic of the past, and Guernsey and Belmont are the only counties in Ohio maintaining roads by this system. A few years more will see the system abolished.

A VERMONT ROAD CLOSED TO AUTOMOBILISTS.

MIDDLEBURY, VT., May 14.—The Board of Selectmen has posted placards along the highway leading from this village to the Ripton town line, announcing that the road from what is known as Roger's Corner in Middlebury village to the Ripton line is not open to automobiles. This is done according to the vote of the town meeting in March. A test case will doubtless be made by the Automobile Club of Vermont as to the right of autoists to use this highway, as they hold State licenses for the operation of motor vehicles. The above-named organization has retained counsel in Middlebury and evidently intends to make a fight against being forced from the highways of that town and Ripton, which has also posted its principal road against use by automobilists.

MISSOURI IN EARNEST ON ROADS QUESTION.

KANSAS CITY, MO., May 12.—The judges of the county court of Boone county have called a meeting of all the county judges of the State for Columbia, May 15, to take some action in the matter of good roads. The meeting is the outcome of the recent decision of the State Supreme Court knocking out the law permitting a special levy for road purposes. It is planned to have some action formulated for presentation to the Legislature at its meeting next year.

A new test on the London-Monte Carlo route is being made with two Rollo-Royce cars, driven by the Hon. C. S. Rolls and Percy Northey, whose aim is not speed, but reliability. They will also do the return journey by car.

"ON THE ROAD TO MANDELAY."

Advices from Charles J. Glidden, who is circling the globe in an automobile, shows that he has reached and passed the land made famous by Kipling's lonely English soldier. Bur-

China was next visited, where 652 miles were added to the score. Then followed Bajour and Anam, making a total of 32,170 miles covered, and thirty-three countries visited when he reached Hong Kong, April 7. Mr. Glidden expects to



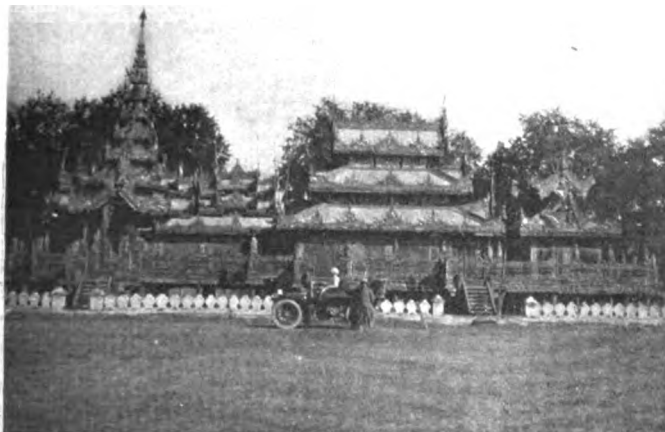
THIS IS A RAILWAY PASSENGER TRAIN IN BURMAH.

mah was the twenty-ninth country on Mr. Glidden's visiting list, and he toured 509 miles therein before going to Ceylon,



AUTOMOBILING AMONG THE DAGABAS, BURMAH.

reach New York June 19, and will resume his trip from Hong Kong in October. China and Japan will be the next countries



IN FRONT OF THE QUEEN'S MONASTERY, MANDELAY.

where he drove his Napier 1,334 miles on the isle where the "spicy breezes" blow softly. After leaving Ceylon, Cochin



TYPICAL VILLAGE ON THE ISLE OF CEYLON.

visited on the resumption of the tour. The automobile will be stored at Hong Kong during the coming summer months.



A MONEY CHANGER AT MANDELAY, BURMAH.



FELLOW TRAVELERS ON THE ROAD IN COCHIN-CHINA.

HEARST'S GOOD ROADS BILL.

WASHINGTON, D. C., May 14.—A bill to promote the construction of a national system of good roads, facilitate the extension of the postal service, and lessen the dependence of the agricultural and industrial interests of the country upon the railroads for transportation has been introduced in Congress by Representative Hearst, of New York. The bill has attracted a great deal of attention, and it is understood its author will leave no stone unturned to get it through Congress.

The bill provides in effect that any state or territory or any county thereof which shall have authorized and undertaken, subject to plans and specifications filed with and duly approved in writing by the Secretary of Agriculture, the construction or reconstruction of more than ten miles of public road outside the limits of any city or incorporated village shall be entitled to receive out of the United States treasury, under certain conditions, one-half the cost thereof. The Secretary of Agriculture shall sign warrants for such payments only after it has been established to his satisfaction: First, that the road for assistance in whose construction claim is made of sufficient public importance to come within the purview of the act, taking into account its use, location, and value as a main market road, a mail route, and as an integral part of a national system of good roads. Second, that the state, territory or county claiming payment has made suitable and adequate provision for the payment of one-half the cost of the entire construction or improvement authorized and undertaken, and for the permanent maintenance thereof without recourse to the United States. Third, that the work has been done in accordance with the approved plans and specifications and at the cost claimed.

No payment herein provided for shall be made except as the work of actual construction progresses, and in no case shall the payment or payments made by the United States in advance of the final completion of a road, for assistance in whose construction claim is made, exceed 40 per centum of the cost of the work then actually completed. The Secretary of Agriculture is given authority to employ the necessary engineers, inspectors and clerks, and make such rules and regulations as may be necessary to carry the proposed law into effect.

The bill appropriates \$50,000,000 for the purposes of the act, but provides that not more than \$10,000,000 shall be expended in any year. Such sum shall be apportioned among the states and territories from which claims are received in proportion that the population of the several states and territories, reckoned according to the last federal census, bears to the total population of the United States. If the claims from any state or territory are for a sum less than the sum to which the state is entitled, the surplus is to be apportioned among the other states from which claims are received in proportion that their population bears to the total population of the states and territories from which claims are received, as nearly as practicable, so as to render available in each year the whole sum of \$10,000,000. The proposed law is to take effect immediately after its enactment.

HOW THE SPLIT-LOG DRAG WORKS IN ILLINOIS.

HENRY, ILL., May 14.—Dragging the roads of Marshall county with the split-log drag has caused many business and professional men of the Illinois Valley town to buy automobiles. Clifford Haws, who owns and operates one of the best appointed garages in the State, says that auto sales have been greatly stimulated by the action of the road authorities. One of the townships is largely populated by Quakers, who run some of the most modern farms in the Middle West. They have rural delivery, telephones, and automobiles, and all of them believe in the efficacy of D. Ward King and his split log. Henry has only 1,500 population but it has ten automobiles.

PENNSYLVANIA'S STATE ROAD.

PHILADELPHIA, May 14.—In the presence of the Governor of the state, the senior United States Senator, congressmen, state officials, railroad magnates, newspaper owners, editors and other men of prominence, the scheme of building a highway across Pennsylvania from this city to Pittsburgh was formally launched at the Union League, in this city, on Saturday night last. The affair took the form of a dinner, and if a successful start means anything, the scheme will have been successfully carried out within the next three or four years.

The idea originated with Samuel Rea, third vice-president of the Pennsylvania railroad, who, as one who has made engineering problems his life work, declared it possible to build such a road within four years at a cost of less than \$4,000,000. Mr. Rea further explained his plans at the dinner, and outlined the more difficult portions of the work—that through the mountains, bridge building, etc. Fourteen counties, he said, would be tapped by the trunk line, and an equal number of large cities and towns are situated along the proposed route. The state has offered to pay a large proportion of the cost of road improvement throughout the state, and it was proposed to take advantage of that offer in helping along this undertaking. A tremendous impetus would be given the cause of good roads throughout the state, and this main stem would be an excellent object lesson to farmers and others of the benefits to be gained from improved highways.

Governor Pennypacker declared the subject to be one well worthy of serious consideration, and practically intimated that when a measure to construct such a through highway as outlined by Mr. Rea came before the Legislature it would receive his support. That it will be favorably mentioned in his next message to that body is almost a certainty. The Governor is a good talker and was listened to with great interest.

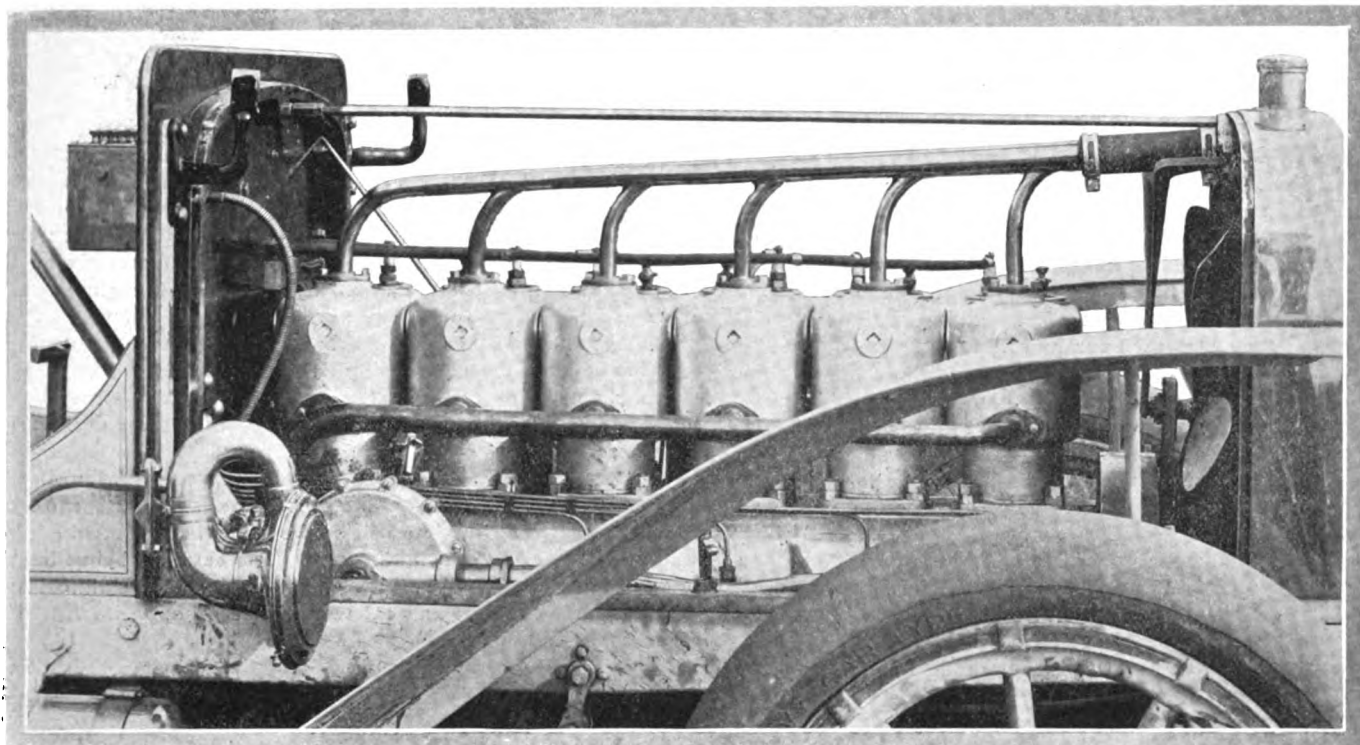
After various speakers had descanted on the merits of the proposition it was decided to at once organize the Pennsylvania Good Roads Association, and was decided to apply at once for a charter. Besides the speakers mentioned there were present Senator Penrose, Congressman Morrell, Isaac Starr, Jr., president of the Pennsylvania Motor Federation; William A. Dick, president of the Automobile Club of Philadelphia; and Robert P. Hooper, treasurer of the Automobile Club of Germantown.

President William A. Dick, of the Automobile Club of Philadelphia, has been elected chairman of the executive committee of the new association, and Henry F. Walton and A. G. Hetherington secretaries. An office has been opened in the North American Building and work will be begun at once. Already large numbers of letters and telegrams of indorsement from all over the state are beginning to reach the committee. Especially commendatory are those from farmers, automobilists and horsemen living along the route of the proposed highway.

PENNSYLVANIA WILL IMPROVE 400 MILES.

PHILADELPHIA, May 14.—Reports from Harrisburg indicate that ere snow flies again upwards of 400 miles of improved road will have been laid down under the Sproul Good Roads law passed at the last regular session of the Legislature. Dauphin, Jefferson, Juniata, Lebanon and Schuylkill counties are the only ones in the State which have failed to put in an application for a share of the money appropriated for building and maintaining good roads. Their shares have reverted to the general roads fund. To this fund will also be added the balance left after paying all expenses of the new Automobile Bureau of the State Highway Department, which handles the business of issuing licenses to motor car owners. This balance, it is believed, will be close to \$15,000.

State Highway Commissioner Hunter, an automobilist himself, is greatly interested in the proposed trans-state road.



THE "BIG SIX" FROM CHICOPEE.

The Stevens-Duryea six-cylinder car is, generally speaking, an enlarged edition of the four-cylinder car of the J. Stevens Arms and Tool Company, of Chicopee Falls, Mass., and embodies the main features of the smaller machine. Some changes have been made, however, in building the larger machine, the most striking of which is perhaps the use of ball bearings throughout.

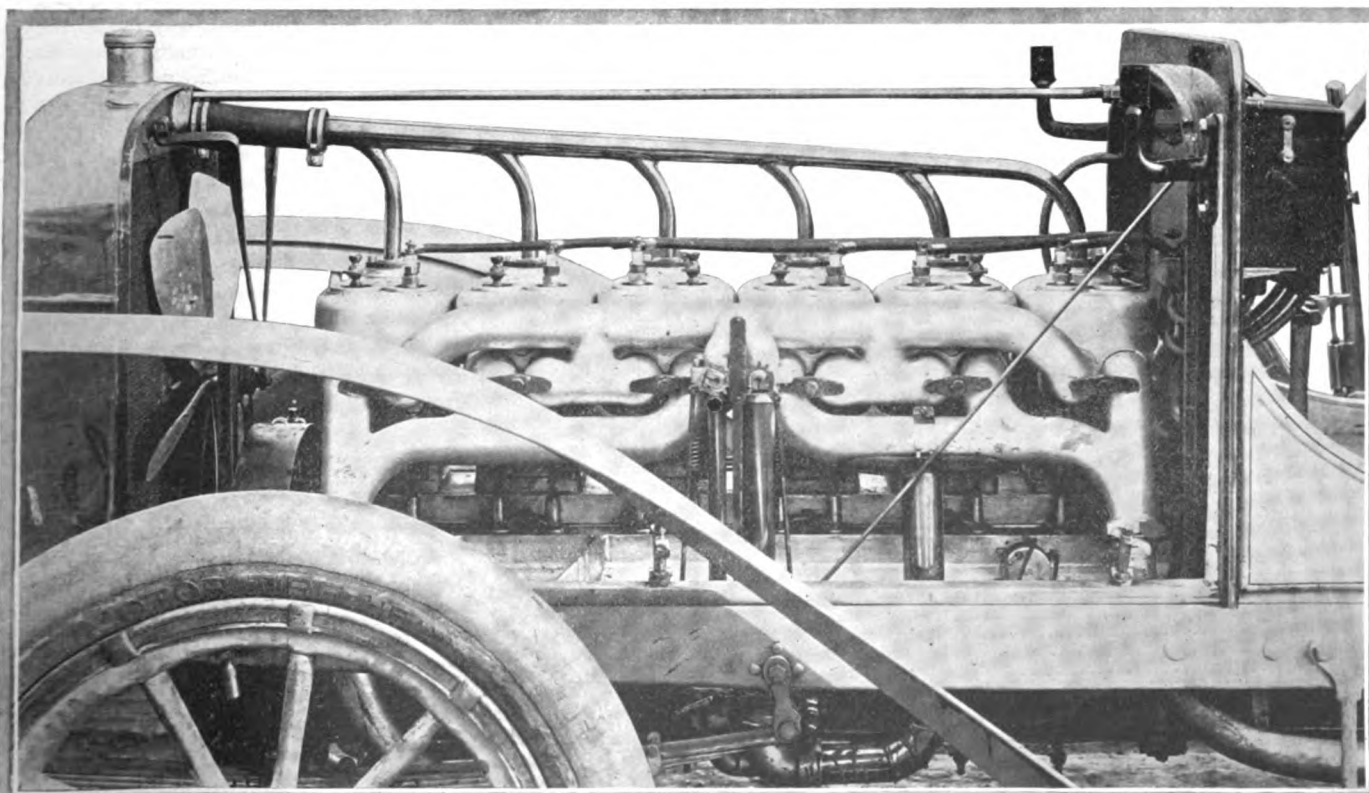
The six-cylinder engine is rated at 50 horsepower and has cylinders of 4 3/4-inch bore and 5 1/4-inch stroke. The crankcase of the engine is connected by a rigid hollow casting with the transmission gearcase, and within the hollow casting the multiple disk

clutch is located. The flywheel is placed at the front of the engine in order to make possible this construction.

The sliding gears of the transmission give three speeds forward and one reverse, operated by a single side lever. Final drive is by shaft and bevel gears to the live rear axle.

With a touring body in which seven persons can be seated, the new car weighs about 2,800 pounds; it is stated to be capable of running from 7 to 70 miles an hour on the high gear.

One of the advantages of the ball bearing crankshaft is stated to be the reduced liability to breakage of the crankshaft, not one having been broken in any of the new cars put out.



THIRTY-FOUR ENTRIES FOR THE GRAND PRIX

By W. F. BRADLEY.

PARIS, May 9.—The entry list for the Grand Prix of the Automobile Club of France is now closed; at any rate so far as engagements at ordinary fees are concerned. Stragglers may enter their cars up to May 15, but will have to pay for the privilege by handing over a \$2,000 fee per car, instead of \$1,000. More than half the entries have come in during the last six days. Only a week ago the number stood at twelve—three cars each for four French firms—and had obstinately remained at this figure for a whole month. Now there are thirty-four cars which will certainly be at the starting line on June 26, irrespective of the number which may be entered at double fees. The list includes twenty-five French champions, six Italians and three Germans, and represents thirteen of the world's most famous automobile builders.

Although numerically the most important, the Grand Prix is not the most international of automobile racers. Whereas in last year's Gordon Bennett contest six nations struggled for supremacy, this year there will only be three great powers to compete for the world's speed trophy. Some surprise is expressed here that neither Wolseley, Napier or other important British firms has thought fit to enter a team, and though a fortnight still remains in which to remedy this, it is generally felt that the English with their practical common sense will not pay \$2,000 per car for what could have been obtained for half that amount a few days before.

Even if America should not send over a car, she will still have a representative, one of the Hotchkiss racers having been confided to Mr. Elliot Fitz Shepherd, an American gentleman driver, at present in training on one of the 1905 racers. With the exception of the Vulpès and the two Grégoire chauffeurs, all the drivers have figured in previous international road races and are well known to the public. It will be noted that Burton, who last year drove an Austrian Mercedes, has this year been promoted to a German machine. Barriaux, who will have charge of the Vulpès, and Tavenaux and Renoncé, of the Grégoire firm, have all had wide experience in important touring contests and are looked upon as very capable speedmen.

Complete List Grand Prix Entries.

No.	Name of Car.	Driver.
1.	Darracq	Hemery.
2.	Darracq	Wagner.
3.	Darracq	Hanriot.
4.	Panhard & Levassor	Heath.
5.	Panhard & Levassor	Teste.
6.	Panhard & Levassor	Tart.
7.	Brasler	Paras.
8.	Brasler	Barillier.
9.	Brasler	Lebrun.
10.	Lorraine Dietrich	Cabriel.
11.	Lorraine Dietrich	Rougier.
12.	Lorraine Dietrich	Duray.
13.	Gobron	Rigoly.
14.	Vulpes	Barriaux.
15.	Renault	Sisz.
16.	Renault	Edmond.
17.	Renault	Richez.
18.	Hotchkiss	Le Blon.
19.	Hotchkiss	Galleron.
20.	Hotchkiss	Elliot Fitz Shepherd
21.	Itala	Cagno.
22.	Itala	Celrano.
23.	Itala	Fabry.
24.	Fiat	Lancia.
25.	Flat	Nazzaro.
26.	Flat	Welttschott.
27.	Bayard Clement	Albert Clément.
28.	Bayard Clement	Villemaln.
29.	Bayard Clement	De la Touloubre.
30.	Grégoire	Tavenaux.
31.	Grégoire	Renoncé.
32.	Mercedes	Jenatzy.
33.	Mercedes	Alexander Burton.
34.	Mercedes	Not yet chosen.

Very little information can be gained about the machines constructed for the big event. The three Brazier cars will be very similar to last year's models, with an increase of five millimeters in the bore of the cylinders. It is stated that they will not be the fastest of the lot, regularity of running on a 750-mile course being regarded by the Brazier engineers as more important than high power.

The Panhard machines will have 175 bore and 170 stroke. It has not yet been decided whether transmission will be by side chains or propeller shaft. Heath is at present practising on a chain-driven machine, and Teste on a machine with cardan drive.

The Dietrich firm will probably be represented by three machines, showing many differences on last year's model. The bore of the cylinders will be the same, but the stroke has been increased by ten millimeters. The cars are being built lower than usual and the wheelbase is shorter. Unlike last year's cars, the inlet and exhaust will be on opposite side of the engine.

Darracq has again built very light cars, their weight not exceeding 1,870 pounds. In general the machines are similar to last year's models, only a few minor changes being made. The motor will give about 12 horsepower more, a differential will be fitted, and the change-speed lever, instead of being under the steering wheel, will be at the side, there being a separate lever for reverse gear.

The Bayard-Clement firm have been experimenting with both a six-cylinder and a four-cylinder model, with transmission by cardan. As the former has given excellent results in the trials, it will be the one to represent the firm on the Sarthe circuit.

On the Hotchkiss cars no great changes are to be expected. The new Hotchkiss carbureter will be fitted and sparking will be by high-tension Eisemann magnets.

In general appearance the Renault cars will be very similar to their touring models. The bore is 175 mm. and the racers are declared to be very fast.

Rigsby will drive a Gobron which has already seen three racing seasons. Excepting a new clutch, no important changes have been made to the car.

The Vulpès, which figures for the first time in a big road race, is a four-cylinder machine of 120 bore and 160 stroke, the cylinders being in pairs. There are three speeds, with direct drive on the high, and transmission by side chains. The wheelbase is 110 inches and the tracks 53 inches, with wheels 920 x 120 and 915 x 105. The gasoline tank has a capacity of about 48 liters, and the car will be geared for 84 miles an hour.

From what can be learned regarding the Mercedes cars, it appears that they will be of six separate cylinders of 150 mm. bore and 140 mm. stroke, running normally at 1,500 revolutions. There will be three speeds, with direct drive on the high by the new Mercedes method, drive by side chains, and the cars will be geared at 110 miles an hour. The wheels will be 910 x 90 in front and 920 x 120 behind, and the total weight of the car will not be more than 2,068 pounds.

No notable changes will be made in the Fiat cars, which, as last year, will have transmission by countershaft and side chains, four-speed gear, four-cylinder motor, with an increase in bore of five millimeters, giving about 125 horsepower.

The Itala cars show no changes on last year's models; their horsepower is greater than that of the French racers, and both they and the Fiat are exceedingly fast.

All the French cars in last year's Gordon Bennett trials will be represented with two exceptions.

THINGS GOING ON AMONG THE CLUBS

Detroit's Club Reelects President George.

DETROIT, MICH., May 14.—At the annual meeting of the Automobile Club of Detroit, held at the Hotel Cadillac, a prosperous condition was shown from the reports of retiring officers. Secretary Harry Skillman reported that there are now 188 members, of whom 67 joined last year. The statement of the finances was presented by Treasurer Louis H. Case, and showed a good working balance on hand. President Edwin S. George reviewed what had been done in the way of good roads movements, and it was agreed that one of the duties a year hence is to secure part of the state appropriation for Wayne county, which pays one-sixth of it, but has never received any direct benefit. The club will ask the next legislature to amend the Holmes automobile law by making it illegal for a chauffeur to take his employer's machine out without permission, and by which the chauffeur shall be held liable for accidents.

In place of the retiring directors, De Witt Loomis, F. O. Paige and George S. Hodges, the club elected George S. Hodges and Arthur Pack, of Pontiac, and James H. Flinn, of Detroit. The following officers were elected by the directors: President, Edwin S. George; first vice-president, C. A. Du Charme; second vice-president, D. M. Ferry, Jr.; third vice-president, Harry G. Hamilton, of Pontiac; secretary, Harry Skillman; treasurer, Louis H. Case. Samuel J. Serrell, of Pontiac, was made consulting engineer. The president named the following chairmen of committees: House, Arthur Pack; contests, runs and tours, George L. Fleitz; laws and ordinances, D. M. Ferry, Jr.; good roads, C. G. Edgar; entertainment, George S. Hodges.

Dues were raised from \$10 to \$15 a year, and the annual meetings in the future will be held on the second Wednesday in April, instead of May. The club-house, overlooking Pine Lake, was opened this week for the season.

Preparing Dead Horse Hill for the Climb.

WORCESTER, MASS., May 14.—Work was commenced to-day by a gang of men in the employ of the Worcester Automobile Club on the preparation of Dead Horse Hill for the climb of May 24. There is a great deal of work to be done this year in order to get it into better condition than last year. S. B. Stevens, of Rome, N. Y., made the 1905 record of 1:09, but Boston men who have run over to Worcester during the past week believe that the record will drop close to the minute mark.

Under the vote which was passed by the aldermen a few days ago, intending contestants next week can practise over the course from Lovell street down to the start and then up the course as long as the approaches to this section of the highway are guarded against any form of accident. Thus there is likely to be some speeding which will interest motorists before the time of the race itself. The largest number of entries are expected from Boston, where Chester I. Campbell, the manager, is making his headquarters. The list of 23 events is puzzling local automobilists to know how the club will run them all off on one day, unless it should be decided at the last moment to have a moonlight session to complete the program.

Successful First Run of the Camdenites.

CAMDEN, N. J., May 14.—Twenty-six cars participated in the opening run of the recently organized Camden Automobile Club on Saturday afternoon last to Egg Harbor and return, about 78 miles. The start was made at 2 o'clock and supper was eaten at Hammonton on the return trip. These runs will be regular bi-weekly fixtures throughout the summer.

A. C. of Pittsburgh and the Scorching Abuse.

PITTSBURGH, May 14.—As a result of the recent furious crusade which Director of Public Safety Ridgway has started against fast automobile drivers, it is likely that some practical measures will be adopted. A dozen or more arrests were made last week, and in one case the action of the authorities was such as to lead the officials of the Automobile Club of Pittsburgh to believe that in justice to the 2,000 automobilists in Greater Pittsburgh they should appeal to the fairness of the new director. A conference followed, and it was found that the police department and the automobile club are nearly in harmony as to the best way of keeping down the speed nuisance. A suggestion has been made which is likely to carry that hereafter the members of the Automobile Club of Pittsburgh shall be provided with police cards by the Department of Public Safety similar to those carried by newspaper reporters, and that in the case of an arrest for alleged fast driving the officer shall release the offender on his own recognizance, and that the club shall guarantee to pay the fine imposed.

Automobile day for the orphans will be June 5. C. M. Miller and Dr. John A. Hawkins are the entertainment committee and President George E. Turner, W. J. Lewis and Paul C. Wolff are the distributing committee. Fred Ingersoll has donated Luna Park to the children that day, and at least 150 autos will be at their service.

Annual Meeting and Banquet, A. C. of Maine.

PORTLAND, ME., May 14.—The annual meeting and the first run of the Automobile Club of Maine, with headquarters in Portland, was largely attended. There were about 100 guests present at the banquet, which was held in the Riverton Park Casino. The following officers were elected for the ensuing year: President, Henry F. Merrill; vice-president, Dr. N. M. Marshall; secretary, Silas B. Adams; treasurer, Maynard D. Hanson; committees—Executive, Robert B. Low, Curtis H. Simonds, George E. Sawyer, Howard Winslow; membership, A. M. Spear, Jr., Albert E. Poole, Charles H. Crocker; runs, Albert H. Hinds, George N. Coyle, Luther C. Gilson; finance, Dr. John W. Whidden, Marshal R. Goding, Leslie A. Mercier; auditing, W. N. Taylor, Herbert J. Willard, Henry H. Davis; law, Judge Enoch Foster, Col. Frederick Hale, Esq., Howard Goding.

The annual meeting and run was completely successful save for one distressing accident. While President Merrill, with four others in the car, was driving along Stevens avenue, he ran into Charles Wilson, who was riding a bicycle, and the latter received injuries from which he died an hour later. Mr. Merrill is now suffering a nervous collapse, and has the deepest sympathy of the whole city for his part in the unfortunate affair.

Springfield A. C. Favors Pending Legislation.

SPRINGFIELD, MASS., May 14.—At the last regular meeting of the Springfield Automobile Club six new members were admitted, and it was voted to support the legislation now pending in the Massachusetts legislature in behalf of automobilists, especially the one for raising the speed limit to 20 miles an hour in the country and to maintain the same speed limit in cities, villages and towns as at present. This bill has been passed to be engrossed by the House and has been sent to the Senate for concurrence. The other bill in which the local club is especially interested is the bill providing that the highway commission shall have the power vested in it to regulate and collect all fines, thus, it is hoped by the automobilists, cutting off any graft which the country constables may enjoy by haling before the courts autoists whom they allege exceed the speed limit.

Chicagoans for the Annual A. A. A. Tour.

CHICAGO, May 14.—The A. A. A. annual tour continues to interest Chicago autoists, and especially more so since President John Farson and Secretary S. S. Gorham, of the A. A. A., returned to Chicago. It is practically certain that the local club will have several entries.

The bonds which have been issued for financing the construction of the Chicago Automobile Club's house on Plymouth court are selling rapidly, according to a prominent member of the club. A brochure has been issued by the club which presents the elevations and ground plans of the new clubhouse. It shows that considerable space will be given to the café and also that the garage will have accommodations for the storage of ninety machines.

The Chicago Automobile Club is still actively keeping up its crusade against scorching, and has requested one of its members, Otto Lehman, to appear before the board of directors Wednesday on the ground of scorching, and to state why he should not be expelled for not living up to the rules and regulations of the organization. Lehman participated in a race on one of the roads and the fact appeared in the city papers, by which means it was brought before the attention of the club.

New York Motor Club's Increasing Membership.

At the May meeting of the New York Motor Club 22 new members were admitted, carrying the total membership up to 200. Secretary H. B. Tucker has issued the annual list of committees, appointed by President Moore. The chairmen of the various committees are as follows: Executive, R. G. Howell; membership, H. M. Swetland; contest, Harry Unwin; technical, Paul L. Snutzel; tours and runs, W. J. Morgan; entertainment and instruction, R. H. Johnson; library, A. N. Jervis; press, A. B. Tucker; route information, Carl Page; road improvement, Frank A. Burrelle; motor boats, Harry A. Lozier; discipline, A. L. Kull; law (special), Joseph F. Darling; recruiting (special), John R. Eustis; aerial navigation (special), Georges Dupuy.

Elaborate preparations are in progress for the second annual Orphans' Day run of the club June 6. There is every indication that this charitable project will eclipse anything of a like nature hitherto accomplished.

Quakers Plan for the Brazier Cup Run.

PHILADELPHIA, May 14.—At last Friday night's meeting of the Board of Governors of the Automobile Club of Philadelphia the Committee on Runs and Tours announced that Saturday, October 20, had been selected for the annual cross-country run for the H. Bartol Brazier Cup. The route will be quadrilateral, with Philadelphia, Doylestown, Quakerstown, and Pottstown at the corners, and the total distance will be close to 110 miles. The usual conditions—cars in touring trim, with full complement of passengers; contestants not restricted as to route, except that each car must be checked at the points mentioned above; equalizing the chances of winning by secretly handicapping the higher-powered cars, etc.—will obtain. An entry list of 25 or 30 cars is confidently looked for.

Bisons Are Increasing Rapidly in Numbers.

BUFFALO, May 14.—At a meeting of the membership committee of the Automobile Club of Buffalo, held on Friday, 39 applications for membership were favorably received. The club is congratulating itself on the successful efforts of the members in the fight against obnoxious automobile laws that were introduced at the session of Legislature which has just closed, and that the bill which will be drafted by William H. Hotchkiss, former president of the club, and which became a law two years ago, will govern automobiles for at least another year. The rapidity with which laws governing the use of automobiles have been made and unmade during the past few years does no credit to legislative sense.

Michiganders Elect New Officers.

GRAND RAPIDS, MICH., May 14.—At the annual meeting of the Grand Rapids Automobile Club, Benjamin P. Merrick was elected president for the ensuing year. The other officers elected were: Vice-president, A. A. Barber; secretary, D. Emmett Welsh; treasurer, N. F. Avery; directors, B. P. Merrick, D. E. Welsh, N. F. Avery, Dr. Henry Hulst, O. H. L. Wernicke and J. T. Byrne. There are at present 74 members in the club. The committee on runs will be appointed later.

CLUB DOINGS IN GENERAL.

PRINCETON, N. J.—A hill climb is scheduled for Friday, May 25, by the University of Princeton Automobile Club. Permits for running the climb has been granted by the borough council of Princeton and the Mercer County Board of Freeholders. This will be the first contest of the kind ever held in this locality.

PROVIDENCE.—A successful inaugural to the season was the first 1906 run of the Rhode Island Automobile Club to Narragansett Pier May 5. Dinner was served at Green's Inn. The board of governors of the club has voted down a proposition to hold a two-day meet at Narragansett Park track, July 3-4, as most of the club's officers expect to be absent on those dates.

NORTH GRAFTON, MASS.—The executive committee of the Grafton Country Club has announced a series of durability and reliability tests for its automobiling members. The first will be held May 19, and will be an ordinary speed contest. The second meet will be held May 29. This will be in the nature of a reliability test and will be from Shrewsbury to Wayside Inn, Sudbury, Mass., and return to the club-house in North Grafton by way of Shrewsbury. Drivers of cars must be amateurs and each may have an amateur assistant acceptable to the committee in charge. Actual time loss and tire troubles will be deducted from the running time, and the car finishing with the fewest stops, least expense, and fastest time will be declared winner. The committee in charge is Charles F. Aldrich, chairman; Harold Knowlton, of Upton, and E. Kent Swift, of Whitinsville.

AN AUTOIST WHO MET THE EMERGENCY.

ROCHELLE, ILL., May 14.—In the matter of resources the Illinois auto driver is seldom at loss to meet any emergency. Charles Berry, who owns a four-seated Rambler, put his wits to work in an unusual way the other night. He was ten miles out in the country when his chain snapped. The accident happened at a place on the highway where on each side stood a house. Both had country telephones, but one of them was out of commission. The folks who owned the other, which was known to be in working order, were absent and the house locked up. Berry was equal to the occasion. In an instant he had scaled the telephone pole, snapped the wires and transferred them to the machine in the other house. He raised the owner of a powerful machine in Rochelle, who quickly got out on the road and pulled Berry out of his trouble, after he had again connected up the wires in the way he had found them.

Rochelle is gaining in the matter of good autos. One of the owners uses his car for livery work with good success.

RIVAL WISCONSIN CITIES CLAIM HONORS.

MILWAUKEE, WIS., May 5.—During the past week several localities in Wisconsin have claimed the greatest number of automobiles in proportion to population. On this basis the city of Racine appears to take precedence over other cities, inasmuch as the population of that city is about 35,000, while the number of cars owned aggregate 70, or one car per 500 population. Milwaukee is second with 350,000 inhabitants and 500 automobiles; in other words, a car for every 700th person. The Twin Cities, Marinette and Menominee, with a combined population of 30,000, claim thirty-eight automobiles, or a machine for every 789 2-19th persons.

CREDIT TO AUTO FOR ITS 'FRISCO WORK

FROM THE SAN FRANCISCO "CHRONICLE."

THAT the automobile played an all but indispensable part in saving the western part of San Francisco, and at the same time has proved invaluable in the serious business of governing the city through its greatest stress, is conceded by every man who has had his eyes open during the ten days or so that have elapsed since the earthquake. Old men in the bread lines, who had



RUINS OF THE MERCANTILE LIBRARY BUILDING.

This building was situated at the northeast corner of Van Ness and Golden Gate avenues. The ground floor was occupied by the Middleton Motor Car Company. The garage of the Auto Livery Company on the opposite side of Van Ness avenue, though built of wood, escaped with a few broken windows.

previously occupied much of their time in supper-table denunciation of the whizz-wagons, now have nothing but praise for them. Men high in official service, who know best of all just how efficient has been the service of the gasoline and steam machines, go even further and say that but for the auto it would not have been possible to save even a portion of the city or to take care of the sick or to preserve a semblance of law and order.

"The auto has been the salvation of San Francisco," said a business man yesterday—a business man whose business is not the sale of automobiles.

Now that the impressment of private machines into public service has been stopped by official order, it is possible to look back calmly upon the first week that followed the earthquake and to view the benefits resulting from a summary seizure of machines by officials. That the seizure in isolated cases by youthful sentries who did not know the difference between the use and abuse of a privilege, and who thought that the power vested in them gave them a license to take any machine that came along when they wanted a ride for a few blocks was unjust is a fact that has since been realized by officials as well as owners. Since affairs have settled, too, there has been an insistent complaint from some owners that many other owners purposely disabled cars to save them from impressment.

These, however, are trivial complaints when compared with the good accomplished by the autos. They were devil wagons turned into chariots of mercy. When fire threatened the Mechanics' Pavilion, which had been made an emergency hospital and was tested to its capacity with the influx of sick and wounded, automobiles rushed to the rescue and conveyed the patients to a place of safety. It is no exaggeration to say that the saving of the lives of many of these patients was due solely to the automobiles.

The saving of life was, of course, the most important service rendered by the automobile.

The doctors in the service of the Red Cross Society found the auto not only a handy but an indispensable means of getting around from place to place. The relief workers, in the transportation of supplies, also found that they could get around with

urgently needed articles of food and clothing much more readily than by any other means of conveyance. The officials of the city, in speeding here and there in the performance of their duty, would not have been able to cover the ground or do half the work they did if it had not been for the automobiles.

At present, when affairs are settling down more to a routine basis, the machines are still rendering service which cannot be calculated in dollars and cents. Until street cars are running again over all the lines they will continue to be indispensable.

The providing of gasoline for these machines was a problem at first which had the drivers guessing. H. C. Breeden, the local agent for the Standard Oil Company, came to the rescue, and the much-maligned concern has since the earthquake furnished, gratis, to drivers and owners, all the gasoline that was needed. In all, it is estimated that nearly 15,000 gallons of gasoline have been used.

There is no accurate record of the exact number of machines seized for the public service, but automobile men place the figure at 200.

The substitution of police whistles for honk-honk horns and the long, wailing screech of the newer brand of warning to pedestrians have been features noticeable every hour of the day since the big shake-up. Both the police whistle and the wailing screecher have evidently done their work, for while the autos have chugged along with no limit on the speed permitted, accidents have been fewer than in the days before the fire.

MORE AUTO STORIES OF THE CATASTROPHE.

From W. F. Culberson, the Pacific Coast representative of the George N. Pierce Cimpamy, comes another 'Frisco story:

"The store of the Mobile Carriage Company, our agents in San Francisco, just escaped the fire, though the garage across the street was a little shaken up with the dynamite explosions. Had it not been for the services of the automobile the death list would have been doubled and perhaps trebled. When Mechanics' Pavilion, where the dead and dying had been placed, was endangered, the automobiles responded and not a life was lost. Cars were



L. L. WHITMAN AND WIFE FLEEING SAN FRANCISCO.

forced over heaps of brick, glass, hot cinders, and into every conceivable place to save people. The Pierce proved itself to be pure gold. The little two-cylinders that have been in the rent service for years, even when overloaded, did not falter, except where some strange driver abused them. Of the four-cylinder cars too much cannot be said. From the morning of the 18th up to the present time they have been going day and night. When one

driver dropped from fatigue another was put in his place, but even with these changes these large Arrow cars have never hesitated.

"One of the deplorable incidents was the shooting of H. C. Tilden, the vice-president of the Mobile Carriage Company. Mr. Tilden had entered his car in the Red Cross Service, and was driving the car himself. He had worked incessantly. After taking his family to a place of safety on last Friday evening he was returning from Menlo Park, when he was challenged by a self-appointed vigilant committee. He had given the counter-sign, "Red Cross," and had passed the sentries fifty feet when they began to fire, for some unknown reason. A rifle ball passed through the tonneau and front seat and struck Mr. Tilden in the back, the bullet passing through his heart.

"After I had rendered all the services I could I turned my attention to Oakland, which had been reported to me as safe. I took one of the Arrow cars as it came into the garage from an all-night run and started around the bay to Oakland. It was the only way I could reach here. The Arrow car brought me to this place safe and sound, and it is now in the service of the Federal Government."

Transcontinentalist Whitman Tells of His Escape.

From Pasadena, Cal., whither he fled after the San Francisco earthquake, L. L. Whitman, the transcontinental automobilist, writes THE AUTOMOBILE as follows:

"Mrs. Whitman and I were in San Francisco at the time of the disaster, and having my old transcontinental Franklin on hand, I dug it out of the back part of our agency quarters, filled the tank with gasoline, and putting a trunk on behind, left the city after three days of terrible conditions. One day I carried women and children to Golden Gate Park, dumping their hastily-snatched baggage, and going after others.

"After leaving the city we had a fine run 500 miles south to Los Angeles. The California scenery is very beautiful at this time of the year, and had we not been through the awful three days of terror, we would have enjoyed it more thoroughly."

To One Company from Its 'Frisco Agents.

Several of the telegrams from the Middleton Motor Car Company, the San Francisco agents of the Autocar, tell their own story:

"April 28.—Store ruined. Will be in position for business again within three days."

"May 1.—Allow all runabouts to come. Can handle thirty at once, and after that as fast as you can ship them."

"May 4.—Were you able to stop car with six runabouts in transit at time of fire? If so, wire where it is and rush same forward. Also how soon can you forward more? We can sell thirty for cash if we can get them soon."

These telegrams would indicate that the availability and value of the automobile will be decidedly apparent in San Francisco for some time to come.

"REO MOUNTAINEER" HAS ROUGH GOING.

DAVENPORT, IOWA, May 12.—The *Reo Mountaineer*, which left Des Moines in the midst of the hard rainstorm of last Monday, pulled into this city at 7:30 o'clock to-night. It was raining when the car arrived in Davenport, and from the mud-spattered appearance of both car and crew, the trip across the state must have been a strenuous one. For three days the car was tied up at the little Dutch town of Polla. The clay roads in that vicinity being impassable, the situation was anything but an alluring one to Transcontinentalist Megargel, who had Chicago on his mind as the oasis in the desert of mud, but on Thursday morning, with tire chains securely wrapped around each rear wheel, the trip east was resumed. Ruts, some of them fourteen inches deep, were encountered wherever mud had hardened. After a couple of days in Davenport the trip toward Chicago will be resumed.

NEW YORK OPEN-AIR SHOW.

With few exceptions every automobile of prominence sold in New York City will be exhibited at the open-air show of the New York Automobile Trade Association, to take place at the Empire City track May 24, 25 and 26. Intending buyers will have an opportunity of inspecting the various makes, having demonstration rides, and watching the various contests that will take place on the track morning and afternoon. Incidentally the aerial navigators will figure in the carnival, and there will be daily ascensions to add to the novelty of the occasion. Herewith is the list of exhibitors:

AUTOMOBILES.

Smith & Mabley.	Peter Fogarty.
White Sewing Machine Co.	Nielson Motor Car Co.
Cryder & Co.	Maxwell Briscoe Motor Car Co.
Covell & Crosby Motor Co.	Winton Motor Carriage Co.
Oldsmobile Co. of N. Y.	New Amsterdam Motor Co.
N. Y. Motor Car Co.	Auto Import Co.
Darracq Automobile Co.	Theo. Schultz.
E. T. Kimball & Co.	Cadillac Co. of N. Y.
Ardsley Motor Car Co.	Advance Motor Co.
Aerocar Company.	H. J. Koehler Co.
A. G. Spalding Bros.	Frayer-Miller Co.
Majestic Auto Co.	C. A. Duerr Co.
Wayne Automobile Co.	Welch Motor Car Co.
Rainier Company.	P. A. Fogarty.
Matheson Motor Co.	Homan & Schultz.
Reo Motor Car Co.	Geo. J. Scott Motor Co.
Decauville Automobile Co.	De Dietrich Import Co.

ACCESSORIES.

Ralms & Co.	Jacob Veith.
Eastern Carbon Works.	Michellin Products Selling Co.
Conn. Telephone & Electric Co.	Newcomb Carbureter Co.
Pennsylvania Rubber Co.	Mutual Accessories Co. of Am.
R. & P. Traction Tread Tire Co.	Havermeyer Oil Co.
E. T. Kimball Co.	Voorhees Rubber Mfg. Co.
Allen Bag and Specialty Co.	Vacuum Oil Co.
Duplex Ignition Co.	The Automobile.
Diezemann Shock Absorber Co.	Acme Autometer Co.
Hartford Suspension Co.	Automobile Magazine.
Gaither-Owen Carbureter Co.	

CHICAGO MAY HAVE OPEN-AIR SHOW.

CHICAGO, May 14.—It is very probable that Chicago will have an open-air automobile show this summer, and practically all of the local dealers have expressed themselves in favor of the proposition. In connection with the show it is proposed to have a program of fourteen events, one of them novelty contests. There will be five classes if the plans go through. Class A will consist of single-cylinder gasoline cars; Class B will take in the two-cylinder cars; Class C, four cylinders; Class D, six cylinders and over; and Class E, all steam-driven machines.

CANADA'S FIRST RAILWAY MOTOR CAR.

MONTREAL, May 14.—The first railway motor car to be constructed and used in Canada made its initial trip this week on the Canadian Pacific Railway, from Montreal to Vaudreuil. Canadian Pacific officials believe that motor cars constructed on the principle of the one built will solve the difficulty of suburban traffic, and within a short time this car will be placed in commission on some of the suburban routes, and other cars constructed at the Angus shops. At some stages of the trial trip the car developed a speed of sixty miles an hour. The car was constructed under the supervision of Mr. Vaughan, who modeled it according to British patterns, with modifications necessary to suit the demands of the Canadian railways. It is a regular first-class standard railway car with seating capacity for forty passengers, and a smoking compartment accommodating sixteen.

There are over 16,000 cars and cycles registered in the County of London alone, as the new letters "L. C.," which were chosen when "A 9999" was registered, have already been seen in combination with a higher figure than 6,000.

CALIFORNIA'S BEACH COURSE.

PIZMO, CAL., May 8.—The beach speedway, used nearly a century ago by Indians for their numerous pony races, and later by the cowboys from the big cattle ranches, is now to become the straightaway course of the automobiles on the Pacific Coast. Last summer many automobilists stopped over here on their trips between Los Angeles and San Francisco and were so enthusiastic over the wide, hard beach that it was finally decided to have the stretch tried by experts to see if it was really fast.

Pizmo is about half way between San Francisco and Los Angeles, nearer the southern metropolis than San Francisco. The old mission road, now known as "El Camino Real," passes within a half mile of the town, coming to the coast at this point from the Santa Ynez Mission, sixty miles south, which lies back of the Santa Ynez Mountains.

April 19 a party of experts from Los Angeles left that city in five cars to tour to this point and examine the beach. They reached here on the third day, having driven over the road carefully to examine it and mark it out for an endurance run which had been proposed in the southern city. It was conclusively shown that the beach was hard and fast, and adapted for racing. The seashore at Long Beach, near Los Angeles, had been tested some months previous, and found to be much too slow. There is only one other beach



PIZMO BEACH, 1904, POPE-TOLEDO DOING A MILE 1:09.

on the Pacific Coast that rivals Pizmo, and that will be tried by the same experts later.

Pizmo is far better favored than Ormond as to the back country, for the roads are good about here, both north and south. The country is a rich farming community, with land worth from \$200 to \$300 an acre for a hundred miles or more inland. This is a natural stopping point for the second day going north from Los Angeles or the second day coming south from San Francisco. A large garage has been built, machine shop fitted up, and supplies of all kinds are kept. There is a comfortable hotel, known as the Pizmo Inn, and a tent city of seventy-five tents and many boarding-houses.

The result of the races June 10 and 11 will tell the story as to whether Ormond Beach must take a back seat. Extensive racing will be done here next winter, when the host of automobile winter tourists are in California.

The committee of the Autocomile Club of Great Britain has decided not to arrange a race for high-powered touring cars in the Isle of Man this season. It is quite probable, however, that an event will be promoted for steam cars, provided entries are received for six steamers of three different makes. The regulations for such a contest would be based on those of the Tourist Trophy, with, however, increased fuel allowance.

LOS ANGELES HAS OVER 3,000 AUTOMOBILES.

LOS ANGELES, CAL., May 14.—The trade in Los Angeles has not been seriously affected by the earthquake, as 'Frisco is 500 miles north of here and separated by seven ranges of mountains. Southern California is a world in itself, and the conditions here are far different than those in the northern metropolis. Possibly two-thirds of all of the automobiles owned in California are



ON THE OCEAN HIGHWAY ABOVE SANTA BARBARA.

found in the southern half of the State. In Los Angeles over 3,000 automobiles are now in use, and the commercial vehicles are now becoming common here.

Eighty-five models of automobiles are sold in Los Angeles. Probably more than a score of large buildings have been erected in the last two years for exclusive use by the automobile trade.

The sale of automobiles in Los Angeles last year amounted to over 700 machines, and the previous year to over 450. Single dealers in this city during the past year disposed of as many as 300 cars.

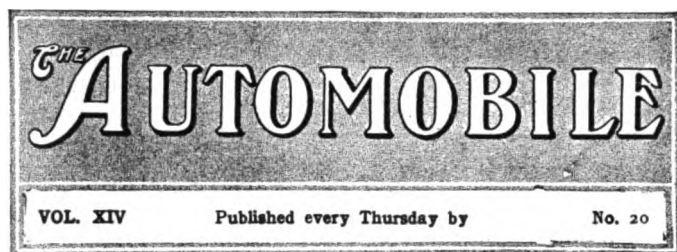
Of course, most of the automobile business of Southern California is done from Los Angeles, and probably two-thirds of all of the cars sold are kept here. The total number of sales in Southern California during 1905 is hardly possible to obtain, as many dealers refuse to give the exact figures to the press representatives. A very careful estimate by one who is closely connected with the trade in Los Angeles the past year shows the



ALONG THE ROAD NORTH OF SANTA BARBARA.

total amount to be over \$2,000,000. In addition to the business done by agents of Eastern makes, there is the Tourist factory in this city, which turns out an average of about 150 automobiles during the year.

Of the commercial vehicles the electric trucks seem to be most in favor, and one concern, the California Auto Despatch Company, now has seventeen in use, all giving splendid service.



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**What Is Meant
by Efficiency.**

At first impression it does not seem a difficult matter to determine the efficiency of an automobile; yet, after a little consideration, it will be seen that before setting out to find the "efficiency" an agreement must be reached as to what is meant by efficiency. How many experienced automobilists would agree upon a common definition? A strictly technical definition of the term is the "ratio of useful work to energy expended." In a test like the recent two-gallon contest of the A. C. A. the energy is furnished by the two gallons of fuel and the useful work is represented by the distance traveled by the loaded machine. Narrowing down the efficiency determination to these practical limitations does not free the result from empirical values, as the skill of the driver is an unknown quantity and the chance obstructions in the road which might hinder or delay the progress of a competing car have also an x value. The rule that what is sauce for the goose is sauce for the gander may reasonably be held to apply, however, and if the results are not positive, they are at any rate comparative.

But this by no means answers the question as to what efficiency in an automobile means, from the owner's standpoint. In the recent test, for instance, the simple conditions took no account of the ratio of live load to dead load, nor of costs of lubricating oil, tire, and machinery wear. Roughly speaking, it was a test of thermodynamic and mechanical efficiency.

There are many things that go to make up the efficiency of an automobile considering the term in a popular or non-technical sense. Fuel economy is, of course, a desideratum, and yet in the total of a year's expenses of car maintenance, fuel will not be nearly the largest item. A car wasteful in fuel that possessed "ability" to keep out of the repair shop might reasonably be called efficient. Other desirable efficiencies are ability to main-

tain a good road speed on hill or level without too much gear changing, ease of riding—which indicates an efficiency of suspension—and small destructive effect on tires—which is closely tied up with the weight question, especially the dead weight; and so on.

It is no criticism of the club's test that the scope of its inquiry was limited. A simple test answers the very desirable purpose of calling public attention to the possibilities of the automobile, and stimulates a healthy rivalry among builders. Yet such contests can never replace the real road race, which is a test to destruction of all but the best that modern automobile engineering can produce.



**Once More the Price
of Gasoline Soars.**

With the free alcohol bill liable to strangulation in the United States Senate, the price of gasoline goes up another notch. When one read that the Standard Oil Company, during the San Francisco catastrophe, supplied, without cost, gasoline for the automobiles, he instinctively began to calculate as to the manner in which this unexpected "generosity" would be neutralized by the giant octopus of the country. Every avenue of influence which automobilists can direct toward the dollar-blinded Senate should be congested, with demands that the free alcohol bill be reported from committee and passed immediately. It is difficult for a man to preserve his sense of discrimination under such circumstances, and if the era of socialism ever comes in this country it will be traceable directly to the obstinate policy now being pursued at Washington. The temper of the people is reaching such a degree that any trifling with it will bring effects far reaching in their results. That the automobile industry is more or less at the mercy of this trust of trusts is a condition that bodes ill for its future unless relief is secured from some quarter, and the free alcohol bill becomes a source of vital interest at this time. The Automobile Club of America is to be commended for its energy in this direction, and President John Farson, of the American Automobile Association, as well as president of the Chicago Automobile Club, will add to the prestige of the national organization if he will set in motion all the power of the chain of clubs extending across the entire country.



**The French Club and
the Vanderbilt Race.**

One of the problems which may confront the 1906 Vanderbilt Cup Commission will be the selection of the French team for the American race. The Automobile Club of France—which is unquestionably controlled by the French makers—wanted no more of the Gordon Bennett race because France could only have just as many cars as any other country. The Vanderbilt Cup race was a similar event, and therefore France declined to run a contest for the American trophy. France considered that it was entitled to a greater number of contestants than any other country, basing its claim upon the money invested in the industry, in which it must be admitted the French have been leaders from the outset. Therefore came the institution of the Grand Prix, which has thirty-four entries and only nine foreign cars, six of which come from Italy and three from Germany. France's declination to play unless it has very much the best of it may be tenable from the French commercial standpoint, but on the ground of sportsmanship it is open to considerable criticism. At any rate, the situation is embarrassing, as it relates to the Vanderbilt race. Will the Automobile Club of France select a French team for the Vanderbilt Cup, for which it declined to conduct a competition? Since the event takes place in another country, the A. C. F. may be courteous enough to provide in some manner for the selection of the quintette. Otherwise the Vanderbilt Cup Commission may find it necessary to accept the first five cars finishing in the Grand Prix, providing they also enter for the American event.

THE VANDERBILT CUP RACE.

Vanderbilt Cup race matters have taken on a new character with the issuing of the entry blanks by Chairman J. D. Thompson, from whom they can be obtained by addressing him at No. 26 West Twenty-seventh street, New York City. The details of the big event are clearly set forth, and this time there will not be any misunderstanding regarding the selection of the five cars which will represent the United States. The first five cars to finish in the September 22 trial race will qualify by so doing. The entry fee of \$1,000 will undoubtedly keep out those concerns which might enter simply for the preliminary advertising.

The Pope-Toledo, B-L-M, Frayer-Miller and Oldsmobile figure as the first four entrants, and others will probably follow in quick succession, for the American elimination race will be limited to 25 cars and entries will close July 1.

Regarding the foreign entries there seems to be no question regarding the prompt selection of five cars from Italy and Germany, and unquestionably England will have one or more cars.

The French situation is a bit complicated in view of the attitude of the French club declining to conduct either the Gordon Bennett or Vanderbilt races and supplying a substitute in the Grand Prix. Correspondence is now in progress between the Automobile Club of America, which acts as the foreign correspondent of the American Automobile Association and the Automobile Club of France. If the French club declines to assist in selecting the French team for the American race, the Commission may decide to accept the first five French cars as they finish in the Grand Prix, which plan would appear to be a solution of the difficulty.

MONROE COUNTY ROAD RACE LABOR DAY.

Only three members out of 150 of the Rochester Automobile Club voted against the holding of a road race in Monroe county on Labor Day, providing proper permission can be secured from the highway commissioners and the Board of Supervisors. It was decided to have the event for stock cars only, but possibly this idea may be modified and provision made for the high-speed cars in addition. Though the Rochester club will do the main work of managing the race, the New York State Automobile Association will be behind the project. Several substantial cups, one valued at \$1,500 and another at \$1,000, are assured, and there may be a \$2,500 trophy. The probable entrance fee is \$250. Four circuits of a 26-mile course, mainly over improved roads, will be the distance of the race. Twenty enthusiasts, who will be known as "commissioners," will advance enough funds to insure the financial responsibility of the event.

INDIANA WILL HAVE A MAY 24 CLIMB.

INDIANAPOLIS, IND., May 14.—The hill-climbing contest that has been much discussed during the last two months will be held on the hill at Glen Valley, eight miles southwest of this city, on the afternoon of May 24. It was first planned to hold the contest on Michigan Hill, but the fact that the hill is on one of the main roads leading to the city, and that permission could not be gained to bar general traffic from it for the afternoon, it was thought best to hold the contest on the Glen Valley hill. This hill is about a quarter of a mile long and has a 10 per cent. grade, being slightly steeper than Michigan Hill.

ORMOND-DAYTONA MEET AS USUAL.

The Ormond-Daytona meet will take place during the week beginning Monday, January 21, 1907, those having the matter in charge having decided that March dates would be less practicable. This will bring the meet, as usual, between the New York and Chicago shows.

GASOLINE SOARS: ALCOHOL VITAL.

President Dave H. Morris, of the Automobile Club of America, while addressing the club members on Monday evening last at the presentation of the prizes to the winners of the two-gallon efficiency contest, referred to the importance of the movement for the removal of the tax from denaturized alcohol, and urged the members and their friends to write their Congressmen on the subject and do all in their power to further the cause of free alcohol for industrial purposes. Mr. Moscovics, of the New York Frayer-Miller branch, made the extremely interesting statement that his company had carried out some experiments with alcohol, using at first an ordinary carburetor and a motor designed to run on gasoline. The machine was capable of traveling 28 miles on a gallon of gasoline. With alcohol in the tank, the car made 24.3 miles to a gallon on ordinary roads. Though the engine ran satisfactorily on alcohol once it was started, difficulty was experienced in obtaining the initial explosions; the carburetor had to be heated by means of a blow-torch before an explosive vapor could be formed. The experiments have been continued, however, and a carburetor has been designed in which the heat necessary for starting is supplied by electricity. In starting the car it is only necessary to press a button, which closes a circuit and sends the current through the heating device on the carburetor. About ten seconds, Mr. Moscovics stated, is sufficient to heat up the carburetor and permit the motor to be started.

The fight for denaturized alcohol should receive an extra impetus from the recent advance in the price of gasoline made by the Standard Oil Company. Some of the garages supplied with gasoline by the big concern state that they have been called upon to pay 18 cents a gallon, wholesale; and this increase comes not long after a previous advance from 15 cents to 17 cents. Some of these garages have increased the retail price to cover the advance made by the producers, while others are maintaining the old retail price of 20 cents a gallon, though doubt is expressed as to how long this can be continued. With gasoline at 25 cents a gallon retail, and prospects bright for further increases in the future, the question of fuel cost assumes much larger proportions than in the past, notwithstanding the marked increase in the efficiency of gasoline motors. With denaturized alcohol free of duty, however, manufacturers would doubtless turn their attention to the development of motors and carburetors in which the cheaper and more plentiful fuel could be used, leaving the Standard Oil Company to raise its prices as much as it pleased and not affect automobilists. The Valvoline Oil Company, which supplies some of the New York garages with gasoline, has not advanced its prices recently, and garages getting gasoline from that concern are adhering to the old price of 20 cents a gallon.

"AUTOMOBILE OFFICIAL A. A. A. BLUE BOOK."

For the man who tours "The Automobile Official A. A. A. Blue Book," just from the press of the Class Journal Company, will be found invaluable. It contains 599 routes, covering 31,467 miles, distributed over sixteen states, and including Canada. The complete book sells for \$3, but is also issued in three sections, selling at \$1 each. Particularly valuable will be found the special maps of entrances and exits of the larger cities. There are 207 route maps, of which fifteen are full page and seven double, and 144 city maps, with a total of 351 maps of the several kinds. Orders can be placed direct with the Class Journal Company, Flatiron Building, New York City.

A. M. C. M. A. OFFICES IN NEW YORK CITY.

The American Motor Car Manufacturers' Association has decided to remove its offices and the headquarters of the organization from Chicago to New York City. A general manager to succeed R. B. McMullen has not yet been selected, but definite announcement regarding the plans of the association will be made in the near future.

REGISTRATIONS WAY DOWN EAST.

PORTLAND, ME., May 14.—No better idea of the popularity of the automobile in Maine and the constantly increasing business in the Pine Tree State can be gained than that obtained from a consultation of the records of license registration in the office of the Secretary of State in Augusta. All machines and all operators in Maine must now have a license as the result of a law passed by the Legislature of 1905. These licenses are to be obtained at the Secretary of State's office. Through the courtesy of the Hon. Byron Boyd, the incumbent of that office, a representative of THE AUTOMOBILE was enabled this week to gain some valuable data on the growth of the sport in Maine.

As soon as the law went into effect in 1905, there was a rush to the office of the Secretary of State on the part of all owners and chauffeurs to secure licenses. During the first year the law was in force 736 automobiles were registered. This included all the cars owned in the State at that time. Up to the present date there have been 138 registrations in 1906, which, added to the 736 of the year previous, makes the total of 874. It is confidently predicted that before the summer is passed the registration will pass 1,000.

During the first year of the license the larger per cent. of cars were of the runabout type, but this year the touring car has gained in popularity. Of the 138 new automobiles registered 73 are of the runabout type and 65 are touring cars. The number of licenses issued last year to persons operating automobiles was 985 and the number issued to date is 1,143, or an increase of 158 this year. The owners and operators of the automobiles have taken kindly to the law and there has never been an objection raised to paying the license.

The amount of money received by the State for registration and licenses, after deducting all the expenses, was \$2,828.27 in 1905. The amount received so far this year is about \$500. The number of motorcycles registered in 1905 was 104, and there have been only six new ones added so far this season. The number of dealers' registrations issued in 1905 was 25, and this year there have been 11 added. In the issuing of certificates of registration to dealers the letter B is placed before the number as a distinguishing mark from the ordinary registration as an individual and the letter A before the numbers issued to motorcycle owners.

HOW NEW JERSEY REGISTRATION PROGRESSES.

TRENTON, N. J., May 12.—List of cars registered in the Secretary of State's office since the new law took effect:

Cadillac, 20; Maxwell, 19; Olds, 14; Pope-Hartford, 14; Locomobile, 12; Autocar, 12; Winton, 10.

Reo, 8; Fiat, 8; Thomas, 8; Panhard, 7; White, 7; Ford, 6; Rambler, 5; Pierce, 5; Franklin, 5; Mercedes, 5.

Royal, 4; Packard, 4; Leon Bollee, 4; Clement, 4; Peerless, 4. Electro, 3; Stevens-Duryea, 3; Vehicle Equipment Co., 3.

Haynes, 2; Mitchell, 2; Waltham, 2; Darracq, 2; Columbia, 2; Buick, 2; Wagner, 2; American Daimler, 2; National, 2; Rochet-Schneider, 2.

Hotchkiss, Martini, Rothschild, Stearns, Apperson, Grout, Premier, Lane, Berg, Foster, Jackson, Acme, Walters, Elmore, Searchmont, Mobile, Mors, Renault, Brasier, Baker, F. N. Co. of Belgium, Marion, De Dion, Bradford, Stahl, English Daimler, Lozier, Eldridge, each 1; total, 238.

VERMONT'S THOUSAND MARK PREDICTED.

MONTPELIER, VT., May 14.—Automobile licenses to the number of 590 and 724 certificates to operators have been issued by Secretary of State F. G. Fleetwood, of Vermont. From present appearances the number of automobiles owned in the state before the close of the year will be close upon 1,000.

An enthusiastic automobilist in Vermont who has a leaning toward statistics calls attention to the fact that horses caused the deaths of fifteen people in the state last year, while only two fatalities occurred that were in any way related to automobiles.



C. A. COBY, OF CHICAGO, ENTERTAINING WILLIE HOPPE AND LOUIS CURE, THE BILLIARD EXPERTS, IN HIS THOMAS "FLYER."

THE LOZIER WAS NOT A DEAD ONE.

The Lozier Motor Company corrects a caption on page 757 of the May 10 issue of THE AUTOMOBILE, wherein a cross-the-page picture had as a part of its information: "Lozier dead on left." The Lozier company states that when the picture was taken the Lozier was not "dead," but still on its way to the top of Greenwich Hill, "where it finished in tenth place, among the first eighteen cars. The Lozier was the only touring car of 35 horsepower or over, and carried a greater total weight than any other of the first twenty-five cars to finish."

THE CURIOUS BOY AND THE AUTO.

TRENTON, N. J., May 14.—Dr. Howard K. Stokes, brother of the Governor of New Jersey, recently experienced an unusual accident to his machine in this city. Mr. Stokes went into a café, leaving his White steamer in the care of a boy about ten years of age. While in the café the curious youngster began examining the different levers, and in a twinkling the machine started at full speed through Hanover street, finally dashing against the wall of the Alhambra Hotel, on North Warren street. The boy was thrown into the air and the machine badly damaged.

BALTIMORE'S COURSE CHANGES HANDS.

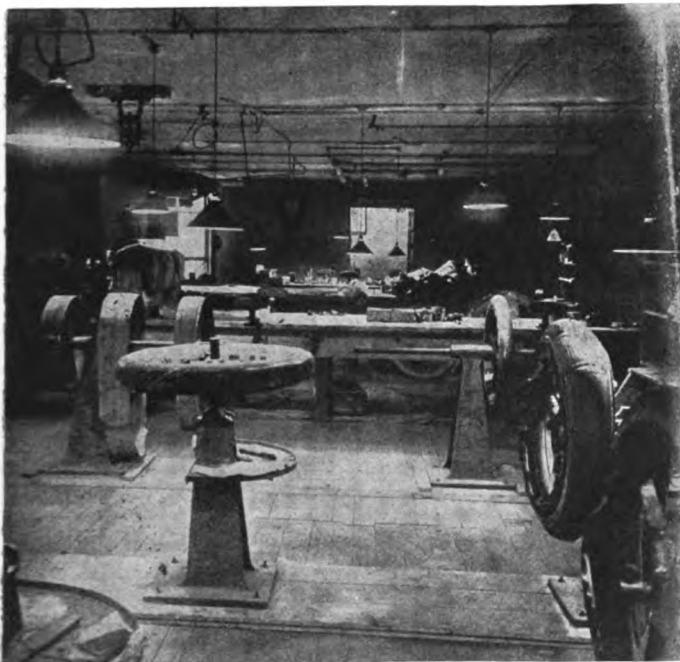
BALTIMORE, May 14.—August Fenneman, president of the company which owns and operates Electric Park, has announced that the property will change hands. He says that Philadelphians are interested in the deal.



OLDSMOBILE MODEL S, 200-HOUR NON-STOP AT DETROIT—HUSS AND WRIGHT, FRONT; SCHNEIDER AND SCHOFIELD, REAR.

THE ART OF TIRE REPAIRING.

A new art has developed in the United States within the last few years. It is the repairing of automobile tires. How rapid has been the growth of this trade can be realized only by a visit to one of the large tire repair stations in the large cities. Many interesting things in connection with the art are to be seen on such a visit. In the repair department of the Continental Caoutchouc Company, 43 Warren street, New York, where large preparations have been made and a huge stock of tire parts and accessories laid in in anticipation of an unprecedented demand on the facilities of the shop this season, tires are even now coming in at the rate of nearly fifty a day for repair, and during the summer from fifteen to twenty skilled workmen will be employed. Yet this particular repair department was established only last summer. Moreover, it takes care of the repairing of Continental tires for only a limited territory, as there is a larger Continental repair depot in Buffalo, and others in Philadelphia, Boston, and Chicago. Emil Grossman, manager of the American branch of the German house, left New York last week for the Pacific coast,



INTERIOR TIRE SHOP EQUIPPED WITH MODERN MACHINERY.

to establish sub-agencies in Denver and to re-establish the San Francisco business following the earthquake and fire.

At the New York house, which supplies all sub-agencies with new goods and with parts and supplies for repairs, a stock valued at \$85,000 has just been laid in, preparatory to the beginning of the rush season. This stock consists of shoes, of European and American sizes, inner tubes, neatly packed in cylindrical pasteboard boxes, new valves, repair kits, detaching tools, waterproof tire cases, tire sleeves, and casing bandages. The casing bandages are a comparatively new form of emergency repair, lately imported. They are very flexible and slightly elastic bands of rubber-treated canvas, three inches wide by six feet long, and provided with two buckles at one end and corresponding perforated strap ends on the other extremity. In event of a blow-out, gash, or bad blister, this band is bound around the tire and rim in a helical manner while the tire is partially deflated, and is buckled in place. When the tire is inflated the bandage holds the casing firmly in form and permits of driving fully 200 miles until permanent repairs can be made.

Although some used tires are returned to the Hanover factory to be "scrapped," few tires get to this hopeless stage.

one of the most common causes for sending them to the scrap pile being the hardening of the beads so that it becomes practically impossible to attach and detach the shoes.

Retreading is one of the most common repairs. When tires require this treatment most of the old rubber tread is cut and peeled off by hand. Most of what remains is ground off by means of a small wheel thickly studded with short, sharp pins, which is revolved rapidly by steam power. This leaves a rough finish all over the tire, on which the rubber cement that is now applied adheres thoroughly. Ready-made treads in the form of flat bands of rubber of proper length and width to exactly cover the shoes of all sizes are kept in stock, some with smooth round treads, and others with flat corrugated treads for racing cars. These are coated inside with cement, and after the cement has partly set, the treads are applied to the shoes, which are mounted on expanding iron mandrels. When a dozen tires are thus prepared they are placed on a small iron truck, with the mandrels still inside to insure the tires retaining their shape, and the truck is wheeled into a large boiler, where the tires are vulcanized in steam for an hour, at pressures of 75 and 150 pounds to the square inch. They are then cooled and dusted with chalk, when they are again like new and ready for shipment.

Usually the tires returned for repair have the canvas damaged, by a cut, blowout, or rim chafing. In such case all the rubber and fabric is carefully cut away from the damaged place or places and new pieces of canvas cemented in place. These are then sewed down to the old canvas, the stitching sometimes being run all around the shoe, at quarter to half-inch intervals. When the patches are comparatively small, solid chunks of rubber are carefully cut to the right shape and with scarfed edges to set into the places where the old rubber has been removed and new canvas applied. Cementing is done and the tire steamed.

Many a tire that to a layman looks beyond redemption comes out of the shop looking, and for service wearing, practically as well as new.

PAPER TIRES FOR AUTOMOBILES.

MILWAUKEE, Wis., May 5.—J. W. Carhart, well known in Wisconsin as the builder of the first steam automobile, has invented a paper tire for automobiles. The tire, he claims, is a great improvement over those manufactured out of rubber, inasmuch as it is cheaper, more durable, cannot be punctured, requires no pumping, and never goes flat. Furthermore, he maintains that his paper tires are as soft and resilient as pneumatic tires, and that they may be utilized wherever rubber tires are made use of. The tires are composed of heavy binder's board, sawed into sections corresponding to the circle of the wheel. Four or more of these make the circuit of the wheel, being built upon the rim by adding one layer or segment to another with white lead or other paint between. A thick sheet of rubber is wrapped around the rim before the tire is built upon it, thus forming a cushion or foundation. After sufficient laminæ have been applied to constitute the desired thickness, metal plates are applied to both sides of the tire, which are bolted through, and hold it securely. In order to avoid rigidity the plates are so arranged as not to meet. The tread of the tire is flat, the paper forming a cushion, while the metal plates are not flush with the tread.

Since the Easter holidays, with their glorious weather and natural exodus from the cities, several English papers have commenced a wordy war against the "national nuisance," the dust, which would be most laudable were not motoring indirectly attacked. In order to cut away as much ground as possible from under the antagonists' feet, the Nottingham A. C. has decided to hold no more club runs, and to cancel all such fixtures for this season. This prompt action will find ready imitators elsewhere, is the opinion of our English correspondent.

ARTISTIC EXAMPLE OF REMODELING.

Comfort and appearance in a touring car are attributes that are gaining in importance every year with the user. There are, undoubtedly, many cars of excellent workmanship, but of old-style design, which, at an expenditure of a



JESSE B. CORNWALL'S REMODELED TYPE D LOCOMOBILE.

moderate sum, can be transformed in appearance and made to ride more comfortably. An interesting case is that of Jesse B. Cornwall, who has been running a 1904 type D Locomobile in the hilly country about Redding Ridge, Conn. Early this spring Mr. Cornwall took his car to a carriage builder, who remodeled the body, lengthened the chassis frame, repainted the outfit entirely and added a luggage carrier, the cost of the various items approximating \$270—a figure which, it is stated, is rather low for one job of the kind, and the firm doing the work would not estimate again so low in a similar case. The wheelbase of the car shown was increased from 36 inches to approximately 106 inches and the rear-entrance tonneau was closed up at the back and made into a side-entrance tonneau of exceptionally roomy dimensions. The car is remodeled, is thoroughly up to date in external appearance and comfort, and the machinery is substantially as good as when it was built.

NEW FACTORY STARTED AT NEW HAVEN.

NEW HAVEN, CONN., May 15.—Papers of incorporation have been filed in Hartford by the Ultra Motor Company, of this city. The incorporators are Joseph Schaeffers and John H. Connell, of New Haven, and John K. Brachvogel and Otto S. Jung, of New York City. The company is capitalized at \$25,000. The new concern proposes to manufacture, build and construct engines, motors, automobiles and motor boats and all their appurtenances. They will build a large factory in this city.



FIRE CHIEF CROKER OF NEW YORK IN HIS AMERICAN MERCEDES.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

May 14-19—New Orleans (La.) Automobile and Motor Show.
May 24-26—Open Air Show, Empire City Track, New York Trade Association.

Tours.

May 30...—Endurance Run, Salt Lake City to Ogden, Utah. Bert Fuller, Manager, Salt Lake City.
June 6...—Orphans' Day, Second Annual Celebration by the New York Motor Club.
June 16-18—Three-Day Tour, Bay State Automobile Association, Boston to Rye Beach, N. H.
June 18-23—Second Annual Economy Test, New York Motor Club.
June 21-26—Second Annual Tour, Albany Automobile Club, Albany to Boston and Return.
July 12...—Annual A. A. A. Tour, Chicago to Bretton Woods, N. H. Rules for the Glidden Trophy operative from Buffalo.
Sept.....—Endurance Run, Denver to Colorado Springs. Centennial Celebration Discovery of Pike's Peak.

Race Meets and Hill Climbs.

May 19...—Cincinnati (O.) Paddock Hill Climb Automobile Club of Cincinnati.
May.....—Richmond, Ind., 10-mile Obstacle Road Race, Wayne County Automobile Club.
May 24...—Glen Valley Hill Climb, at Indianapolis, Ind.
May 24...—Dead Horse Hill Climb, Leicester, Mass., Worcester Automobile Club (Chester I. Campbell, Manager, 5 Park Sq., Boston).
May 25...—Princeton, N. J., Hill Climb of the University of Princeton Automobile Club.
May 30...—Boston Annual Meet of the Bay State Automobile Association, Readville Track.
May 30...—Baltimore (Md.) Race Meet, Maryland Motor Exhibition Association.
Sept. 3...—100-Mile Road Race, on 25-Mile Circuit in Monroe County, N. Y. Rochester Automobile Club and New York State Automobile Association.
Sept. 22...—American Elimination Trials for Vanderbilt Cup Race (Long Island Course probable).
Sept.....—Colorado Springs. Two-Day Meet. Centennial Celebration Discovery of Pike's Peak.
Oct. 6...—Vanderbilt Cup Race, American Automobile Association.

Motorcycle Tours and Contests.

May 30.—Fort George Hill Climb, New York Motorcycle Club.
July 3-7.—Annual Endurance Run and Meet, Federation American Motorcyclists, Rochester, N. Y.

FOREIGN.

Shows.

Oct. 5-14—Leipsiz (Germany) Exhibition, Krystall Palast.
Nov. 1...—New Zealand International Exhibition opens at Christchurch.
Nov. 1-16—Berlin (Germany) Automobile Exhibition.
Nov. 15-24—London, Olympia Motor Show.
Nov. 23-Dec. 1—London, Stanley Show, Agricultural Hall.

Tours.

June 5-13—Herkomer Cup Touring and Speed Trials, Munich, Bavaria.
June 11-16—Land's End to John O'Groat's. Auto Cycle Club of Great Britain.
June 13-16—Scottish Reliability Trials.
July 29-Aug. 15.—Circuit Européen, 3,000 miles. Paris, Milan, Vienna, Berlin, Cologne, Paris.

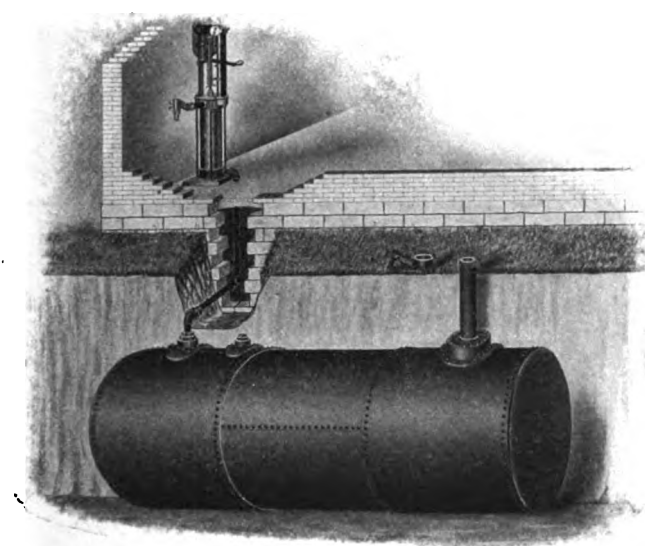
Races, Etc.

May 27...—Motor Cycle Club of France, Championships.
June 26-27—Le Grand Prix, Sarthe Circuit, France.
July 8...—International Cup Race for Motorcycles, Cesky Club Motocyclistu of Austria.
July 15...—Suze-Mont Cenis Hill Climb (Italy). Automobile Club of Turin.
Aug. 1-15—Circuit des Ardennes (Belgium).
Aug. 15-16—Ventoux (France) Automobile Meeting.
Aug. 14-19—Ostend (Belgium) Meet.
Aug. 23...—Semmering Hill Climb.
Aug. 27-Sept. 2—Brescia (Italy) Automobile Meeting.
Sept. 27...—Tourist Trophy Race, Isle of Man, Auto Club of Great Britain.
Oct. 7...—Chateau Thierry (France) Hill Climb.
Oct. 28...—Gaillon (France) Hill Climb.

NEW FIVE-GALLON GASOLINE PUMP.

A new model of the Bowser system of oil storage and control, long distance equipment, has been put on the market by S. F. Bowser & Company, Inc., of Fort Wayne, Ind. Their standard garage equipment, as is well known, is furnished with a gallon pump which, at the option of the operator, measures gallons and their fractions at a stroke. The new pump is designed to meet the demand of users of gasoline in large quantities. It is of five gallons capacity, each full stroke pumping and measuring five gallons instead of one. This pump is also capable of such adjustment as to accurately measure two and one-half gallons, gallons, or quarts, as desired, so that it will answer every requirement.

In a great many garages, and especially in the larger cities, gasoline is used in very large quantities. A great many cars are cared for and some of the cars hold as much as thirty gallons of gasoline. With this five-gallon pump such a car can be supplied in from one to two minutes, where ordinarily fifteen to twenty minutes would be required. In addition to the style illustrated in this column, which is operated by hand, this equipment is furnished with a power pump arranged for either belt or



FIVE-GALLON BOWSER PUMP WITH 20-BARREL TANK.

direct connection. Such an outfit can be set to pump five gallons or five hundred gallons, and when the required amount is drawn, the pumping ceases.

The claims advanced for the new outfit are that the maximum amount of gasoline can be pumped and accurately measured in the least amount of time, with the minimum labor and without loss, inconvenience or danger.

REINCORPORATES TO MAKE NEW AXLE.

COLUMBUS, O., May 14.—The Direct Drive Axle Company, with \$150,000 capital stock, is the successor of the Columbus Auto Axle Company, of this city. The company will manufacture a new design of automobile axle, invented by Irvin Pleukharp, a young college graduate, which is claimed to be a distinct improvement over the axles now in use. It is persistently rumored that Pleukharp has been offered \$100,000 for his invention, which is the result of experiments covering several years.

The main feature of the new axle is that there are no transmission gears, and the change from a high to low speed can be made in an instant, not by the accustomed gears, but by means of positive clutches located on the back axle. The inventor says there is a gain of from 15 to 20 per cent. in power on the low speed, which will facilitate hill climbing and starting.



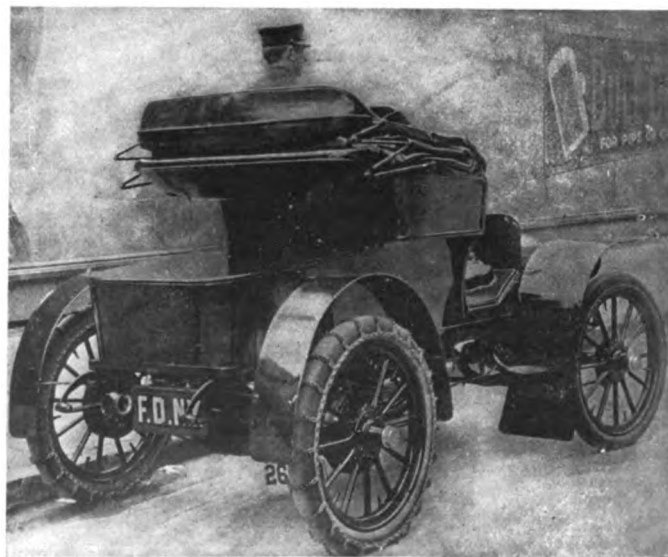
FRONT VIEW BAKER ELECTRIC FIRE DEPARTMENT CAR.

ELECTRICS FOR FIRE DEPARTMENT USE.

The quickness and ease with which an electric vehicle can be gotten under way, and the simplicity of its operation, make it an ideal machine for many purposes. One of the new models manufactured by the Baker Motor Vehicle Company, of Cleveland, O., has proved to be so speedy and to have such a large mileage capacity that two of the machines have been placed in the service of the New York Fire Department and are in use by deputy chiefs. These cars are known as speed wagons; they are two-passenger runabouts of comparatively light weight, about 1,700 pounds, equipped with twenty-five cells, and the maximum speed is given as thirty-two miles an hour. The average mileage on one charge of the battery is given as from forty to fifty miles. This distance was greatly exceeded in a test run made in Cleveland, when a speed wagon covered 84 3-4 miles before the battery were exhausted.

C. B. Rice, the New York representative of the Baker company, states that two more speed wagons are to be supplied to the New York Fire Department shortly.

One of the important advantages of electric machines for the exacting work of the deputy fire chiefs is that they can be started instantly. This, together with speed and the ability to travel a

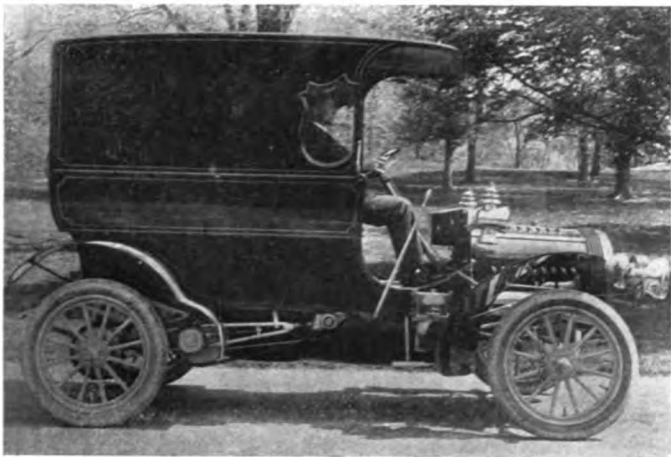


VIEW OF SAME CAR FROM THE REAR.

reasonable distance, forms a combination that should give excellent results and at the same time prove economical.

NEW RAMBLER DELIVERY WAGON.

A new model has been added to the product of Thomas B. Jeffery & Co., of Kenosha, Wis., manufacturers of the Rambler cars. The new machine is a delivery wagon, with closed body, and is propelled by a double opposed-cylinder motor of 20 horsepower placed under the body and driving through a two-speed planetary transmission and side chains to the rear wheels, the arrangement of power and transmission mechanism being practi-



RAMBLER 20-HORSEPOWER DELIVERY WAGON.

cally the same as in the Rambler 20-horsepower surrey. In fact, the entire wagon, with the exception of the body, is built on the lines of the Rambler surrey, type Two, including the distinctive round topped bonnet; the component parts are heavier, however, to enable them to withstand the severe work imposed by commercial service.

The frame is made of a single piece of pressed channel steel with cross pieces of the same material; in the cross pieces the ends are extended and formed into reinforcements for the joints, so that separate corner plates are not required. Front and rear axles are of heavy steel tubing, 2 inches in diameter; the wheels run on ball bearings and are 32 inches in diameter and fitted with 4-inch pneumatic tires. The wheelbase is 102 inches and the tread 56 1-2 inches.

The engine is water-cooled by the thermo-syphon system, so that no pump is necessary; no fan is used. The cylinders have a bore of 5 inches and the stroke is 6 inches; the pistons are fitted with no less than six rings each, placed in pairs in three grooves, with joints on opposite sides. Ignition is by jump spark, two vibrator coils being mounted on the dash; the timing of the spark is done automatically by a governor. The carbureter is of the float-feed type, automatically supplying a correct mixture at all engine speeds. Steering is by wheel with tilting pillar, and the throttle is actuated by a small wheel mounted on the pillar under and parallel with the steering wheel. A minor point that has received attention is the means for priming the engine for starting in cold weather. A priming cock located in the upper part of the valve chamber wall is fitted with a cap which may be removed and filled with gasoline from a draw-off cock in the tank; the gasoline is poured in without the necessity for using a "gun" or squirt-can. The first Rambler delivery wagon to reach New York has been placed in the Rambler garage on Sixty-second street. The car is said to be an entirely new one throughout, and up to the time the sample was received in New York none had been placed on the market.

BOSTON DEALERS PLAN TO REORGANIZE.

BOSTON, May 14.—The Boston Automobile Dealers' Association has taken a stand in favor of the passage by Congress of the free alcohol bill now held up in a sub-committee of Senator Aldrich's committee of the Senate. At a special meeting of the association last week resolutions in favor of the measure were adopted, and

it was voted that the secretary of the association notify Senators Henry Cabot Lodge and William Murray Crane of this action and urge them to use their efforts to secure favorable action upon the bill. The local dealers are enthusiastic over the prospect of a cheaper fuel, for they have seen gasoline grow steadily dearer in the course of the past few years. At the same meeting the association pledged the use of twenty-seven cars to give the blind boys of the Perkins Institution for the Blind an outing this spring. Last year the boys of the institution were taken on an automobile trip to Sharon, and they enjoyed the experience so thoroughly that they are eager for another trip.

The reorganization of the association so as to make it more strictly a dealers' association was brought up and a committee consisting of J. H. MacAlman, of the Columbia, J. W. Maguire, of the Pierce, J. S. Hathaway, of the White, A. P. Underhill, of the Knox and Stearns, and A. E. Morrison, of the Morrison-Tyler Company, was appointed to consider a revision of the by-laws.

The meeting was preceded by a banquet at the Hotel Lenox, which was attended by thirty-five members. President Kenneth E. Skinner acted as toastmaster.

CONVERTIBLE CAR SCORES A SUCCESS.

A neat application of the combination business delivery wagon and pleasure touring car has been made in the car just delivered by the E. H. V. Company, of Middletown, Conn., makers of compound cars, to Robert C. Crowthers, the Cincinnati agent.

The car is primarily a delivery wagon to be used by the safe deposit department of The Fireproof Storage Company, a concern that is erecting a \$140,000 fireproof storage warehouse in Cincinnati. The entire body of the car is removable, and on Sundays, and at such times when the business of the company does not require the services of the delivery wagon, a light touring car body completely replaces the delivery body, and the officials of the company have at their disposal a pleasure automobile. The E. H. V. Company pronounced the combination business and pleasure idea feasible, and outdid itself in turning out a finished job. And to carry the "convertible" idea still further, used for the touring car body its detachable tonneau design, so that the new car is a delivery wagon, a light touring car, and a runabout all in one. The new machine is now in daily use on the streets of Cincinnati.

Four bolts and four screws make the entire change in bodies. A gasoline tank and a set of batteries is carried in each body, so



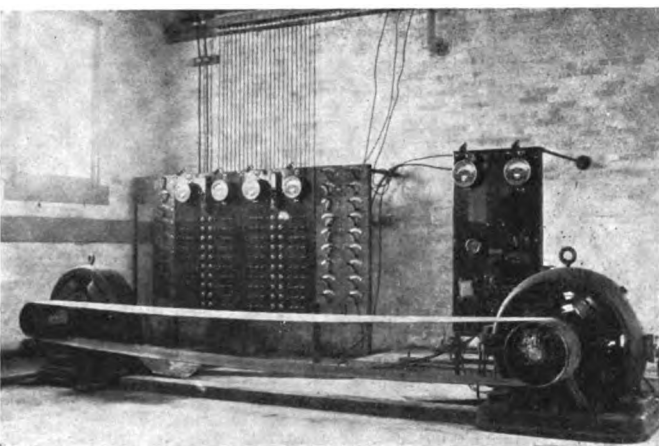
COMPOUND COMBINATION CAR IN CINCINNATI.

it is only necessary to unscrew a union in the gasoline pipe, and disconnect the batteries in making the change. The convertible scheme is a very simple one, owing to the light weight of the aluminum bodies, and if the gear of one car is unsuitable to the other, a change of sprockets can be made in a few minutes.

A MODEL TOLEDO GARAGE.

In some of the medium-sized cities of the Middle West the finest automobile garages are to be found in the residence districts, and there is more of a disposition shown to erect buildings which resemble modern factories—all on one floor and with plenty of yard room. One of the finest and most complete garages of this type is that of the Atwood Automobile Company, of Toledo, O. The establishment is located at 2815 Monroe street, one of the best residence streets of the city and about one and one-half miles from the center of the business district. The garage is of plain but pleasing design, the front being pressed brick with stone trimmings and ornamental cornices. Pretty flower beds and nicely kept lawn add to the attractiveness of the front. The building is 100 feet wide by 300 feet deep. One side is a wing 34 by 300 feet, while the main garage presents a clear floor without a single post, 66 by 300 feet. The roof is made up of heavy timber trusses, held together with heavy bolts. There are a number of skylights through the center and the entire interior is painted white. At night it is brilliantly illuminated by a number of arc lamps.

In one corner of the room is a charging plant consisting of a belted motor generator set switchboard for incoming alternating current lines, and a larger board with plugs and controlling switches for charging thirty machines. The entire floor of the main room is cement. In another corner of the room



MOTOR GENERATOR SET AND SWITCHBOARDS—ATWOOD GARAGE.

BURLINGTON HAS A NEW GARAGE.

The new garage at the Van Ness House, Burlington, Vt., is now ready for the use of patrons of the hotel and any others who care to take advantage of its appointments. The structure is of brick and is fireproof, and will accommodate fifteen machines, there being large entrances, so that three machines can enter at the same time. Skilled employees are in attendance at all times, so that any break can be repaired, and automobile supplies are kept on hand. A novel feature of the garage is the gasoline pump. A large tank containing 300 gallons of gasoline is buried in the ground at some distance from the building. By turning a lever on a pump inside the building the gasoline flows from the tank in any quantity desired, the exact amount being registered. Another feature is an overhead rotary rack, to facilitate the cleaning of cars.

FINE GARAGE FOR SUMMER COLONY.

OCONOMOWOC, Wis., May 10.—A. A. Eastman, of this place, is building a fine brick garage. Such an enterprise is much needed here. Oconomowoc is the country place of Chicago and St. Louis colonies of wealthy people, and practically all of them own costly automobiles. Some of them have three cars, and there will be more this year than ever.

Last year the owners gave a floral parade that eclipsed anything ever brought off in the Badger state. The prize was awarded to L. D. Dozier, of St. Louis, who transformed the appearance of his car into a long boat. The summer crowd already is beginning to appear, and most of them will be here before the month ends.

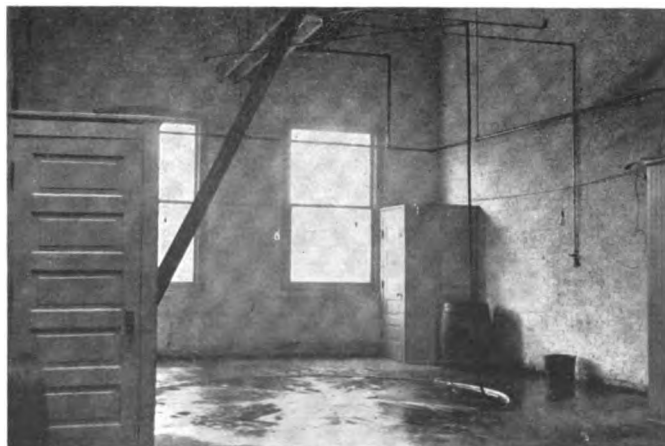


INTERIOR NEW GARAGE ATWOOD AUTOMOBILE CO., TOLEDO, O.

is a washrack, provided with a turntable and a revolving hose rack. In the center there is a walled-in oil room provided with fireproof doors. Several long-distance Bowser outfits, with tanks placed below ground outside the building, furnish supplies of gasoline and lubricating oils. The rear of the room is partitioned off for a woodworking shop. The entire rear portion of the wing is given over to the machine shop, which contains a number of modern machine tools. The wing also contains a stock room for large parts, a stock room for small parts fitted with numerous shelves and drawers, a large sales floor, a battery room, a locker room for employees, a ladies' waiting room, two toilet rooms, bath room for employees and a suite of offices with private offices for the manager, bookkeeper, etc.

The entire building is heated with steam heat and well lighted. The offices and retiring rooms are nicely furnished. The Atwood Automobile Company started business last December, and is just getting settled in the new establishment. The company handles the Pope-Waverley, Franklin, Elmore, Northern, Pope-Tribune, Pope-Hartford and Packard lines in Toledo and vicinity, and make a specialty of supplies and repair work.

The matter of taking care of the large number of automobiles belonging to patrons of baseball games has become a serious question with the management of baseball parks.



WASH RACK WITH TURNTABLE IN ATWOOD GARAGE.

THE GROWING GARAGE LIST.

Frank Gable is building a garage in Alamosa, Colo.

Herman T. Koss is erecting a new garage on Wahl avenue, near Bradford street, Milwaukee, Wis., at a cost of \$16,000.

The Jay A. Hinman Telephone and Electric Company, of Oshkosh, Wis., has opened a garage, known as the Auto Inn, at 226-228 Main street, that city.

A building permit has been issued in Detroit for the erection of the Henwood Auto Garage, at 121 Ferry avenue, East. The owner is J. T. Horning.

Charles Wirtz has opened a new garage at 113 South Front street, St. Mary's, O., and is now deciding on the lines he will handle and purchasing his stock.

A large addition has been built to the garage of L. P. Dorsett at Seventeenth and U streets, N. W., Washington, D. C. This is one of the largest garages in that city.

A splendid new salesroom and storage station for Haynes cars is being fitted up in Kansas City at 1413 Grand avenue, and will be occupied by Cowie & Pierson, local agents for the Haynes.

An old warehouse in Green Bay, Wis., is to be remodeled and fitted up as an automobile storage and repair depot for "Mat" Anheuser, who has taken the local agency for Rambler automobiles.

The Bolton garage has been opened on the corner of Mount Royal avenue and Dolphin street, Baltimore, by Henry A. Broadbelt and A. S. Brown. An up-to-date repair shop has been put in.

The Central Garage Company has opened a large garage and repair shop at 1314 New York avenue, Washington, D. C. The building is 145 feet deep and 75 feet wide, and is capable of holding 150 cars.

John F. Kitchen, of Pittsburgh, Pa., has opened a new garage at 521-525 Homewood avenue, that city, and is ready for the reception of catalogues and quotations from supply houses. The new garage has been named the Belmar.

The Central Garage Co. has been incorporated at Washington, D. C., by John W. Points, Frederick L. Mockabee and Richard C. McAuley, with a capital stock of \$2,000. It will operate a garage and repair shop at 1312 New York avenue, N. W.

The W. W. Garage and Machine Co. has opened an automobile storage, livery and repair station in Cumberland, Md., on North Center street. Tourists driving over the old National Turnpike will find it a convenient place to stop for supplies.

Wildman's Automobile Garage and Machine Shop has just been opened in Belmar, N. J., by Alfred J. Wildman. It adjoins the post-office on F street and, in addition to ordinary care and repair of machines, it is equipped for remodeling and painting cars and has automobiles for hire.

C. F. Ettwein is to open a garage in Kansas City, Mo., at Thirty-seventh and Main streets. Cowie & Pierson, of Kansas City, have their new garage at 1413 Grand avenue, about completed, and the formal opening will take place in a few days.

On account of increased business, the Stirling Garage & Automobile Company, of Elizabeth, N. J., will build a large addition to its present establishment, providing 40,000 square feet of floor space and adding modern equipment and appliances.

A six-story brick building, 25 by 97 feet, is to be erected on Central Park West, north of One Hundredth street, New York, for James E. Kennedy, who has leased the plot of ground for twenty-five years. The architect estimates the cost of the structure at \$25,000. It will have an iron and glass front.

Building permits have been issued in New York City to the Winton Motor Carriage Company for the erection of a \$90,000 garage and salesroom on the northwest corner of Broadway and Seventieth street, and to W. C. Strange for the construction of a \$50,000 garage at 137-139 West Eighty-ninth street.

The Ideal Auto Garage has been opened at 862-864 Jefferson avenue, Brooklyn, Long Island, by Charles Tilgner. The building is a new brick structure, practically fireproof and especially designed with the requirements of automobilists constantly in mind. A stock of supplies is kept on hand.

Little Rock, Ark., now has an automobile company, incorporated with \$10,000 authorized capital stock, under the name Little Rock Automobile Company. There are twenty-six incorporators. Present headquarters are at 118 East Markham street, Little Rock, but a new garage is to be erected by the company on West Markham street, between Spring Street and Broadway.

The new garage of the Berkshire Automobile Company, of Pittsfield, Mass., has opened for business and will prove a great accommodation for tourists visiting that section of the country. The building has accommodations for 150 cars, and a depression in the cement floor underneath a car is filled with white sand to absorb the drippings of oil and gasoline. The garage is equipped with reception rooms for men and women and is finished in Mission style.

The White Sewing Machine Company has purchased a piece of property 53 feet front on Rockwell street, between Bond street and Erie street, one block east of its present garage on Rockwell street, Cleveland, and will erect a six-story garage which it is claimed will be the finest in the country. Work will be started immediately. The White Company will have to abandon its present fine garage on Rockwell street, which is only three years old, as the property has been purchased by the city for its group plan of public buildings.

The new \$25,000 garage of the Stoddard-Dayton Automobile Company, at Fortieth street and Grand Boulevard, Chicago, is now completed and occupied. It will accommodate 100 cars, and the storage space is divided into stalls so that the owner of each car may rent a private compartment separated from the others by steel wire netting and fitted with a locked door. The garage also has a charging plant for charging fifteen electrics simultaneously. The building is two stories high, constructed of pressed brick and white glazed tile.

NEW AGENCIES AND FACTORIES.

O. D. Wheeler, Marlboro, Mass., has taken the local agency for the Moline car.

E. S. Breed, of Boston, has taken on the Buffum car, made at Abington, Mass. He formerly represented the Elmore.

The E. H. V. Company, of Middletown, Conn., has recently placed agencies for the Compound car with Fred E. Dack, Galva, Ill., and Charles A. Caldwell, Bainbridge, Ga.

H. C. Stratton, who represents the American Mercedes, with offices in the Colonial Building, Boylston street, Boston, has also taken on the Eastern agency for the Mora, which is manufactured at Rochester, N. Y.

Finding its old quarters too small to take care of its growing business, the Suffolk Chemical Company, manufacturer of fire extinguishers, has removed its factory from Boston to Weymouth, Mass. The Boston office is located at 170 Summer street, Boston, opposite South Terminal Station.

John N. Goodall and Charles A. Tollman have fitted up an up-to-date machine shop in the electric light plant building of the Portsmouth Machine Company, Portsmouth, N. H., in which they will do repairing of all kinds and manufacture parts for automobile and power boat machinery.

The Pope Motor Car Company, Indianapolis, Ind., has recently appointed the following dealers to represent the Pope-Waverley electrics for 1906: Lancaster Automobile Co., Lancaster, Pa.; Deright Automobile Co., Omaha, Neb.; Automobile & Machinery Co., Macon, Ga.; Wm. Warnock Co., Sioux City, Ia.; H. L. Zobel, Jr., Sea Bright, N. J.; Waverley Electric Automobile Co., Charleston, S. C.; Pueblo Automobile Co., Pueblo, Col.

Jacksonville, Fla., is to have a new automobile factory, the location of which is to be in the large two-story building on East Bay street, that city. The Southern Automobile Manufacturing Company is the name of the new concern which is to be incorporated, and it is officered as follows: President, John B. McDonald, an extensive turpentine operator; vice-president and treasurer, Hubert G. Stone, general manager of the Florida Realty Company; secretary, Hugh E. Partridge, a well-known contractor of that city.

RECENT INCORPORATIONS.

B. & O. Auto Line, Detroit; capital, \$5,000.
Fort Pitt Automobile Company, Pittsburgh, Pa.; capital, \$20,000.

Lubeck Automobile Company, Grand Rapids, Mich.; capital, \$15,000.

Norris Auto Co., Saginaw, Mich.; capital stock increased from \$12,000 to \$25,000.

Automobile Owners Defense Co., Augusta, Me.; capital, \$100,000; in Illinois, \$2,000.

Colonial Automobile Company, Pittsburgh; capital, \$25,000. Incorporator, Harry M. Miller.

Inland Auto Company, Harrington, Wash.; capital, \$10,000. Incorporators: O. M. Graves and H. Cowger.

Coleman Auto Top Co., Detroit; to manufacture carriage and automobile tops; capital stock, \$5,000.

St. Clair Motor Co., of Detroit, Mich.; to manufacture engines and automobiles; capital stock, \$35,000.

Smith Automobile Co., Denver; capital, \$10,000. Incorporators, F. C. Smith, M. W. Smith, and R. W. Smith.

Leader Automobile Co., Milwaukee; capital, \$25,000. Incorporators, George O. Francke, Paul F. Mueller, and Marion E. Wait.

United Bearing Co. of Wilmington, Del.; to manufacture and sell ball bearings for machines of all kinds; capital, \$200,000.

Auto Rental and Repair Company, Chicago; capital, \$2,500. Incorporators: F. W. Richey, J. E. Smeyd and H. A. Pierce.

Grant Square Automobile Co., Brooklyn, N. Y.; capital stock, \$20,000. Directors, C. F. Bolt, Frank Wilson, W. Weston, Brooklyn.

DeBarres Automobile Co.; capital, \$50,000. Directors, W. H. Barnard, William McIlroy, A. E. Salomon and A. F. Jehle, of New York.

Rothschild & Co., capital, \$30,000. Incorporators, William H. Mendel, Maurice M. Rothschild, Nathaniel D. Reich, all of New York.

Williams Garage Co., Brooklyn, N. Y.; capital stock, \$100,000. Directors, H. O. Hyatt, E. H. Barclay, Brooklyn; G. E. Austin, New York.

Leader Automobile Company, Milwaukee, Wis.; capital, \$25,000. Incorporators: George O. Francke, Paul F. Mueller and Marion E. Wait.

C. A. Coey & Co., Chicago; capital, \$5,000; to deal in automobiles. Incorporators, Benjamin Levering, G. N. Beckford, and A. A. Boone.

New York Car and Truck Co., Jersey City, N. J.; capital stock, \$2,000,000. Incorporators, John R. Turner, Harry B. Russell, Thomas S. Strong.

Adams-Farwell Co., Chicago; to deal in automobiles; capital, \$2,500. Incorporators, Eugene Adams, Herbert Adams, and F. O. Farwell.

Vandergrift Automobile Co., Jersey City; capital stock, \$100,000. Incorporators, Pedro G. Salom, Henry G. Morris, and F. Rogers Donahue.

Hesse Automobile Company, Brooklyn, N. Y.; capital, \$1,200. Directors: Emanuel Hesse, J. J. Hesse and Herman Hesse, of Brooklyn.

Matthews Motor Co., Camden, N. J.; capital stock, \$75,000. Incorporators, Louis I. Matthews, J. Morris Wistar, and Craig Hebertson.

American Hortung Battery Co., Jersey City, N. J.; capital, \$500,000. Incorporators, Gustave K. Hortung, George Fagan, and A. M. Lynch.

Eureka Steam Motor and Engine Co., Detroit; capital stock, \$250,000. Incorporators, John Allerdyce, Ellsworth Belknap and Louis G. Bugbee.

Suburban Automobile Service Company, Bissell, Mo.; capital, \$5,000. Incorporators: Lee Meriwether, Robert J. Bowman and Frank S. Reed.

Flatbush Auto Co., Brooklyn, N. Y.; capital, \$5,000. Incorporators, Directors E. G. Appleton, Annie E. Appleton and S. C. Morris, of Brooklyn.

Rochelle Motor Co., New Rochelle, N. Y., capital stock, \$150,000. Directors, E. T. Birdsall, A. S. Winslow, and F. W. Vaughn, of New Rochelle.

Bulck Automobile Company, Kansas City, Mo.; capital stock, \$2,000 all paid in. Incorporators, W. S. Hathaway, H. G. Kirkland, W. F. Schreiber.

Arc Spark Plug Mfg. Co., Toledo, O.; capital stock, \$10,000. Incorporators, Eli A. Stark, P. L. Fancher, H. J. Brubach, M. P. Slack and W. A. Janis.

Auto Cape Top Co., Chicago; capital, \$2,000; to manufacture tops and curtains. Incorporators, A. C. Beighler, H. R. Holden, and C. D. Miller.

Coey Automobile Livery Co., Chicago; capital, \$2,500; to rent automobiles. Incorporators, Benjamin Levering, G. N. Beckford, A. A. Boone.

Metropolitan Garage Co., New York; capital, \$25,000; \$100,000. Directors, H. R. Worthington, Raymond Carrington, and P. R. Towne, of New York.

Manhattan Commercial Co., New York City; to manufacture automobiles; capital, \$500. Directors, A. R. Talon, Brooklyn; and B. W. Wrenn, New York.

Prince Wells Company, Louisville, Ky.; to handle automobiles and accessories; capital stock, \$5,000. Incorporators: Prince Wells, R. L. Wells and M. Erhele.

Meyers Automobile Top Co., Dayton, O.; capital stock, \$25,000. Directors, W. C. Myers, Thomas H. Kelly, John D. Follett, J. W. Durnell, H. T. Bowman.

Multiplex Tube Tire Co., Jersey City, N. J.; capital stock, \$1,000,000. Incorporators, Frank A. Magowan, Frank B. Adams, John F. Fritts, Kenneth A. McLaren.

Jackson, Church & Wilcox Co., Saginaw, Mich.; to manufacture automobiles; capital stock, \$25,000. Incorporators, John L. Jackson, M. L. Wilcox, E. D. Church.

Boulevard Garage Co., Cleveland, Ohio; capital, \$10,000. Incorporators, G. Walter Bruner, H. J. Dunn, C. O. Harmon, H. R. Hoffman, and Willson H. Levens.

Hamilton Garage and Motor Co., New York City; capital stock, \$20,000. Directors, L. W. McFarland, of Yonkers; W. F. Norris, of New York, and F. M. Raynor, of Brooklyn.

McCrea Motor Truck Co., Cleveland, Ohio; capital, \$50,000. Incorporators, George H. Kelley, George G. Whitcomb, C. G. Easty, L. J. Mallin and M. G. McAllenan.

Columbus Sight-Seeing Company, Columbus, O.; capital stock, \$10,000. Incorporators, Benj. Williams, Bert Smith, J. B. Foster, Henry Bechtold, T. J. Farrell, Columbus.

Walden W. Shaw Co., Chicago; to manufacture automobiles and accessories; capital, \$20,000. Incorporators, Walden W. Shaw, Bronson C. Buxton, and Jessie K. Shaw.

Cellulose Safety Tire Co., Chicago; capital, \$25,000; to manufacture automobile tires and supplies. Incorporators, John J. Hendler, Albert M. Thayer, and Benjamin F. Graham.

Welch Motor Car Co. of New York; to deal in automobiles, etc.; capital, \$10,000. Incorporators, Charles A. Hamilton, Burgoyne

Hamilton, Louis H. Periman, all of New York.

Darracq Motor Car Company, Chicago; capital, \$5,000; to deal in automobiles and accessories. Incorporators: Joseph B. McKeague, Hosea W. Wells and Charles C. Stilwell.

Fort Wayne Gear Co., of Fort Wayne, Ind.; to manufacture automobile transmissions; capital stock, \$10,000. Incorporators, M. I. Rosenthal, Joseph Freiburger, and William H. Olds.

Deere-Clark Motor Co., Moline, Ia.; capital stock, \$100,000; to manufacture gas engines, automobiles and machinery. Incorporators, R. F. Druhy, R. S. Blakemore, W. E. Clark, of Moline, Ia.

Auto Service Co., New York City; to make and deal in automobiles; capital stock, \$50,000. Incorporators, R. Bolshaw, E. Stauffer, D. Hyams, F. I. Cramer, and A. Law, of New York City.

South Bend Automobile and Garage Company, South Bend, Ind.; capital, \$5,000. Incorporators: Harry D. Johnson, E. Louis Kuhns, George M. Studebaker, C. A. Carlisle and Nelson J. Riley.

Miller-Hopkins Manufacturing Company, Indianapolis, Ind.; to make and sell automobile accessories; capital stock, \$15,000. Incorporators: William T. Miller, Thomas H. New and Frank Nuckals.

Lexington and Concord Sight-Seeing Co., Boston, Mass.; capital stock, \$10,000. Incorporated to carry tourists in automobiles, by George W. Taylor, Lexington; H. F. Knight, Boston; A. F. Johnson, Saugus.

Hastings Motor Car Supply Company; to manufacture automobile supplies and appliances; capital, \$1,000. Incorporators: Edward S. Perat, George J. Jackson and Cornelius Gallagher, of New York.

Commercial Motor Car Co., St. Louis, Mo.; to make and deal in autos; capital stock, \$10,000. Incorporators, Charles B. McKinney, Frank E. Stevens, and Lou E. Stevens, of St. Louis, and Eugenia E. McKinney, of Irving, Ill.

White Motor Co., 305 Market St., Camden, N. J.; capital, \$150,000; to manufacture automobiles and motor boats. Incorporators, James W. White, of Philadelphia; Charles F. Woodhull, and Charles S. King, of Camden, N. J.

The 2 Co. Motor Company, incorporated in New Jersey, to manufacture all kinds of motors; capital stock, \$1,000,000, to start with \$1,000 capital. Incorporators: Jonathan Jenks, Robert Anderson and J. Leslie Rogers.

TRADE IN MONTREAL.

Montreal, Que., May 14.—It is said that the Minister of Railways and Canals has under consideration the question of using motor cars on the branch lines of the Government railroad.

Recognizing that the automobile has come to stay and that the enemy that existed between it and the horse no longer exists, in that the motor is its best friend, Henry Morgan & Co., one of the largest department stores in Canada, are putting up a new garage which will involve an expenditure of \$50,000. It will be a two-story building with ground floor entrances. In making their debut in the trade, Morgan & Co. have secured the English Argyle and an American machine in the Maxwell-Briscoe. Motor boats will also be handled. Frank B. Stockwell will be manager.

Wilson & Co., of Ottawa, has opened a branch in Montreal and is representing the following well-known lines: Pope-Tribune, Pope-Hartford, Franklin, Baker Electric, and other cars.

NEWS AND TRADE MISCELLANY.

Lyman Read, of Ottawa, Kan., is preparing to tour to Maine in his Stevens-Duryea.

The B. F. Goodrich Co.'s Chicago branch will remove, May 15, from 141 Lake street to the five-story building at 24 Lake street, Chicago.

Extensive additions to the A. D. Meiselbach Motor Vehicle Company's factory, at North Milwaukee, are to be erected, at a cost of \$50,000.

The Twentieth Century Automobile Company, which has the Chicago agency for the Grout gasoline automobiles, has moved to 1421 Michigan avenue, that city.

A Sunday shift of workmen has been put on by the Kansas City Motor Company at its Sheffield works. More attention is being devoted this year to commercial vehicles at this plant.

G. F. Conners, of Port Huron, Mich., has leased a part of the buildings formerly occupied by the Steel and Screw Company, of that city, and will engage in the manufacture of automobile parts.

Capt. E. Yard Breese, of Trenton, N. J., a prominent member of the Mercer County Automobile Club, has purchased his seventh car, a White steamer. Mr. Breese now owns seven machines of different makes.

The foundations of the new Walter automobile factory at East Trenton, N. J., have been completed, and the construction of the walls has commenced. The buildings will have dimensions of 302 feet by 122 feet, and will cost \$30,000.

The new store and warehouse of the Diamond Rubber Company's Chicago branch, at 1523-1531 Michigan avenue, is claimed to be the largest exclusive automobile tire store, warehouse and repair department in the United States.

Charles Splitdorf has joined the Broadway procession and taken a lease of the building 1679 Broadway, between Fifty-second and Fifty-third streets, New York City, and will use it as salesrooms and offices. The present quarters on Vandewater street will be retained as a factory.

Harrison M. Zier has arrived in Chicago from Pasadena, Cal., with his Packard, in which he covered over 8,000 miles of California roads during the past winter. Mr. Zier is a member of the Chicago Automobile Club. He is on his way east to tour New England.

1907 models of the Stearns car, made by the F. B. Stearns Co., of Cleveland, Ohio, have been under test for some time and exhibit some advances in construction. The model is so nearly settled upon that the company is already ordering material for next year, so that the prompt delivery of this season will be duplicated next year.

The Mason Motor Car Company, of Des Moines, Iowa, has just finished its new factory, located at 100 Southeast Fifth street, and will be able to deliver cars by June 15. E. R. Mason is president, and Fred S. Dunsen is superintendent. They will manufacture exclusively 24-horsepower cars with double-opposed engine, called the "Mason."

The Connecticut Telephone & Electric Co., of Meriden, Conn., has placed the Pacific Coast agency for its spark coils with the Geo. P. Moore Co., Inc., of Oakland and Los Angeles, Cal. The Moore Company also had a branch house in San Francisco. When this was destroyed by the recent fire the Oakland branch was at once opened to take care of the business.

The Manufacturers' Motor Car Co., now located at 54-56 West Forty-third street, New York City, has taken a lease on the adjoining buildings, Nos. 50 and 52. The

buildings are at present occupied by the Sidney B. Bowman Automobile Company, and when the latter moves into its new building in the fall the Manufacturers' Company will occupy the four buildings for its sales business.

The northwest corner of Broadway and Sixty-first street, New York City, has been purchased by the Packard Motor Car Company, of Detroit, as a site for its new New York store. The plot contains about 16,800 square feet, and has a frontage of 116 feet on Broadway, and 197 feet on Sixty-first street, with a rear line of 100 feet 5 inches and a northerly line of 136 feet. The selling price of the plot was \$500,000 and was for cash.

The New York, Chicago and Boston branches of the Aerocar Company report heavy sales and increasing demand for these cars. The company states that the air-cooled motor of the Aerocar is proving all that was claimed for it, not only in the smoothness of its operation, but in the fullness and reliability of its power, and that under the most severe tests it always shows an excess of power above that claimed for it, and always has a reserve force in store.

Two large additions have been completed at the Pope Motor Car Company's plant at Indianapolis, Waverley department. The additions increase the available floor space to 192,257 square feet, the newly constructed portions aggregating 19,391 square feet. In the new additions the finishing and body departments will be given more room, retaining their old quarters as well. This expansion will relieve the commercial vehicle department, which has been crowded to its capacity for several months.

The Aerocar Company has announced that it will equip all its cars with Truffault-Hartford suspensions in the future. This arrangement was made by President Alexander Y. Malcomson of the Aerocar Company last week. E. V. Hartford, president of the Hartford Suspension Company, in speaking of the order, said that not less than 300, and possibly 800, sets would be required for the Aerocar output. There are now ten prominent cars that make Hartford suspensions a part of the regular equipment, as follows: Pierce, Peugeot, Locomobile, Studebaker, Aerocar, Brazier, Matheson, Napier, Gobron-Brillie, and Rossell.

The Cadillac Company is in receipt of a letter from Dexter & Crozier, their Auckland, New Zealand, representative, as follows: "It will no doubt be very gratifying to you to know that the model 'B' single-cylinder Cadillac driven by Mr. Crozier made a non-stop run, secured full points and tied for the cup with 12 and 15-horsepower Darracqs for the North Island reliability test of New Zealand. The test was a four days' run to the Hot Lakes District and back again, covering some very hilly and sandy districts. This, considering that the roads were of a very hilly and sandy nature, makes a very creditable performance."

To convince prospective purchasers of the hill-climbing ability of the new model 24-horsepower shaft-driven Columbia car, Hiram Percy Maxim, chief engineer of the Electric Vehicle Company, frequently drives the machine up Church street hill, the steepest grade in or around Hartford. The incline is 23 per cent. practically all the way up; the roadbed is full of depressions and covered with loose stones that render the ascent especially difficult. A few days ago, after Mr. Maxim had made the ascent, an onlooker expressed a willingness to bet any

amount of money that the feat could not be repeated. Mr. Maxim descended, turned around, threw in his clutch and went up the grade so fast that the party with the superfluous change decided to disappear down Spring street before the car gained the summit.

PERSONAL TRADE MENTION.

Charles D. Smith, formerly of the Winton Company's New York branch, has been appointed Eastern supervisor of the Winton Company, with headquarters at Boston.

C. F. Heinkel, for several years general designer for the Elwell Parker Electric Company, of Cleveland, has been promoted to the position of chief draughtsman of the same concern.

Oliver Light, who was associated with Ex-Fire Chief Charles Purroy in the Oldsmobile Company of Baltimore, has returned to New York to live. Mr. Light was recently married.

Fletcher G. Plummer has retired from the Dietz-Plummer Motor Car Company, of Philadelphia, selling out his interest to his partner, John H. Dietz, Jr., who will continue the business.

Louis E. Geyler, senior member of the firm of Geyler & Levy, Chicago agents for the Autocar, has been visiting the company's factory at Ardmore, Pa., during the past week, with a view of hurrying up shipments.

E. C. DeWitt, of the Mercedes Import Company, has returned from his trip to Europe, where he visited the Mercedes factory. The object of his trip was to have the American allotment of Mercedes cars increased by forty machines.

President Kittredge, of the Peerless Motor Car Company, of Cleveland, and Mrs. Kittredge, accompanied by Charles Schmidt, designer for the company and Mrs. Schmidt, have gone to Europe, where they will make a tour of the continent in a Model 14 Peerless.

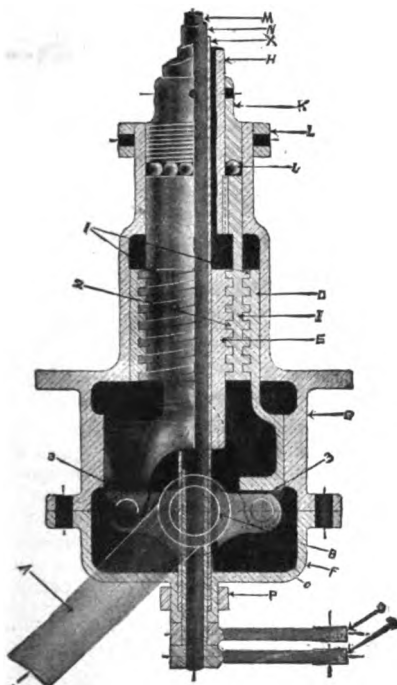
Samuel A. Miles, secretary of the National Association of Automobile Manufacturers, sailed last Thursday on the *Amerika* to visit his mother at his old home in England. He will be absent about six weeks, and will, before he returns, make an automobile trip through France and Germany.

W. J. Morgan has removed his office from 116 Nassau street to Bretton Hall, Eighty-sixth street and Broadway, so as to be nearer the automobile trade center. Mr. Morgan's telephone, which is 3900 Riverside, will be in active use in connection with Orphans' Day, June 6, which is the second annual outing for little orphan children, under the auspices of the New York Motor Club.

Frank Kulick, the well-known driver of the Ford racing cars, is a character. Around the big Detroit factory Kulick is a free lance. Seemingly subject to orders from no one, he is, however, one of the most conscientious workers connected with the concern. His quiet mien makes him difficult to approach, and his lack of words conceals his knowledge of mechanics and ability to test cars. His ability as a driver is well known, and it is recognized that his many triumphs on the track were due, not more to his skill at the wheel, than his greater faculty for tuning up a car to concert pitch. This faculty made him head tester in the Ford plant, and every one of the Model K, six-cylinder touring cars that leaves the factory must pass through his hands for approval. As these cars are coming through at the rate of six a day, Kulick's workday contains something more than eight hours.

INFORMATION FOR BUYERS.

NEW STEERING GEAR.—A new steering gear, illustrated herewith, has been placed on the market by the Gemmer Engine Co., of Wabash, Ind. Referring to the sectional view, *A* is the lever arm, the end of which, not shown, is fitted with the usual ball and socket connection. Shaft *B* is part of the drop forging *C* which is rocked by nuts *D* and *E* as described later. The steering column *H* is rigidly attached to the steel nut *I*. This nut has exterior right hand threads engaging with nut *D*, and internal left hand



SECTIONAL VIEW GEMMER GEAR.

threads engaging with nut *E*. When the shaft is rotated one nut is raised and the other depressed, and the double-armed forging *C* is rocked, oscillating the arm *A*, through which movement is conveyed to the connecting rods and the wheels. A ball thrust bearing *J* is placed at the top of the steel nut. An adjusting nut *K* is provided to take up wear in the threads. Controlling rods *M* and *N* operate the ignition and throttle. The stationary tube *X* is used as a casing, and is secured in the usual way. The lever *A* may be made of any length necessary to give the proper amount of motion to the steering wheels. The possibility of adjusting the entire gear by a single nut is one of the important claims made for the device.

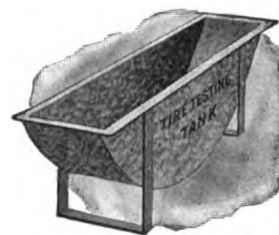
COLUMBIA BATTERIES.—A catalogue of interest to automobilists who are users of dry cells for ignition and flash lamp work has been issued by the National Carbon Co., of Cleveland, O., manufacturers of batteries of many kinds. The Columbia dry cells are made in special shapes for automobile, launch and motorcycle ignition work. A special form is the National Autocell, which consists of a metal case, water and moisture-proof, into which dry cells are sealed, outside terminals being provided for making connections. Autocells are made in rectangular form for automobile work and in tubular form for motorcycles. Another style has a wood case with an insulating lining. A style made especially for De Dion cars, Pierce Motorettes and Peerless cars consists of four cells enclosed in

a waterproof canvas case. Spark coils for automobiles, launches and stationary engines are also listed, as well as dry and wet battery cells for all purposes, flash lamps and other electrical goods.

DAVIS OPPOSED MOTOR.—The double opposed cylinder gasoline motor shown in the accompanying illustration is manufactured by the Davis Mfg. Co., of Milwaukee, Wis., in two sizes, which are practically alike except in point of size. The larger motor has cylinders of 5 inches bore and the stroke is 4 1-2 inches; the smaller motor has a bore of 4 1-2 inches and a 4-inch stroke. The cylinders are water cooled and with each cylinder is integrally cast the head, water jacket, valve chamber and one-half of the crankcase. The two halves of the case are bolted together at the center line by flanges cast on for the purpose; this arrangement is clearly shown in the engraving. The valves are situated on the top of the motor and are all mechanically operated from a single camshaft parallel to and above the crankshaft. The camshaft is easily reached, as are also the cranks and connecting rods, by removing the cover of the crankcase. The valves are easily removable through openings in the valve chambers, closed by bronze screw plugs. In the case of the larger engine, the valves are 2 1-8 inches in diameter and the valve stem guides are 5 1-4 inches long, giving a large bearing area. Crankshaft is of open hearth forged steel 1 3-4 inches in diameter, and runs in long bearings, the bearing at the flywheel end being 5 inches long and at the opposite end 4 inches long. Crankpins are of the same diameter as the main crankshaft bearings, and are 2 1-2 inches long; the connecting rods are of cast steel, of box section. The big end of the connecting rod has a hinged cap, and the split bushing is of bronze with a babbitt lining sweated in. A flange is formed on the end of the crankshaft and to this the flywheel is bolted with six bolts, avoiding the necessity for using keys. All piping is of brass with the exception of the exhaust pipe, in which cast iron is used to withstand the heat. A gear-driven bronze pump serves to circulate the cooling water. A special oil pump is fitted to the Davis engine and is placed in the top of the crankcase cover. The pump has four plungers and no check valves, and is driven from the camshaft through bevel and worm gearing; an oil feed carries lubricant to each of the main bearings. Each plunger is adjusted in the shop to deliver the proper quantity of oil to the bearing it serves, and the adjustment once made is a permanent

one and requires no altering. The oiler contains about half a gallon of oil and requires no more attention than filling with oil, according to the manufacturers. The larger motor measures 31 inches over all and is 19 1-4 inches wide; the weight, with flywheel, is 370 pounds. The smaller machine is 28 inches long and weighs 240 pounds. For special purposes two or more of these motors can be coupled together to make four-cylinder or six-cylinder motors.

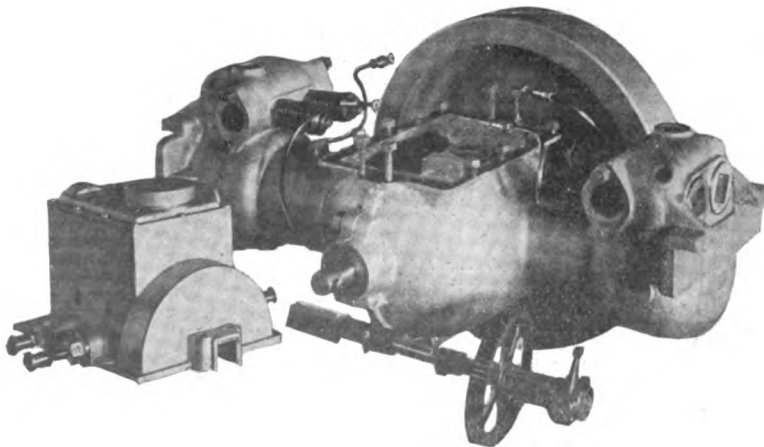
TIRE TESTING TANK.—A tank made especially for tire testing purposes has been brought out by J. H. Edwards, of 59 Park Place, New York. The tire testing tank consists of a galvanized steel pan of the form shown in the accompanying illustration, 30 inches long and 8 inches deep; iron feet are riveted on for the tank to stand on. The idea is to fill the tank with water



EDWARDS TIRE-TESTING TANK.

and place the tire or inner tube in it to locate small punctures, the escaping air showing the leak plainly. The curved shape of the tank makes it particularly convenient for the work for which it is intended.

LEATHER TIRES.—Tires of leather and containing no rubber except in the inner tube are being manufactured by the Anti-Rubber Tire Co. of U. S. A., Los Angeles, California, as the result of experiments that have been in progress for two years by the inventor of the tire, Charles H. Twitchell, of Los Angeles. In these tires not only is rubber avoided in making the shoe, but there is no canvas used in any part, and no stitching. The clincher fastening consists of a series of small steel hooks placed close together along the edges of the shoe, engaging in the flanges of the rim. These hooks, which are only an inch apart, are riveted through the leather, serving to hold the several thicknesses together at the edges. The tire will not slip, the makers state, the steel-on-steel fastening holding securely. The leather used is a special product known as anti-oak leather, being tanned without the use of oak. Many remarkable qualities are attributed to this leather; the makers state that it is about



DAVIS DOUBLE-OPPOSED MOTOR WITH OIL PUMP DIRECTLY CONNECTED.

five times as strong as ordinary leather; that it is entirely waterproof and can be soaked in water for a year without impairing its good qualities; and that it can be boiled without losing its strength and softness. For large tires, 34 inches in diameter and larger, three plies of leather are used, the inner and outer layers having their smooth surfaces turned outward so that there is a smooth surface for the inner tube to rest against and the exterior of the shoe is also smooth. A separate tread, studded with steel rivets, is riveted to the shoe, giving an armored tread that is said to be almost impossible to puncture. The manufacturers state that the severest tests have proved the anti-rubber tires to be practically non-puncturable, stronger than rubber tires and also faster.

NEW AUTO HORN.—Under the name of the Tubaphone, the Miller-Hopkins Mfg. Co., of Indianapolis, Ind., has brought out an exhaust-sounded automobile horn that is extremely well constructed and is handsomely finished. The tubes are of rectangular section, and the air chambers and distributing parts are of cast brass; the component parts are held together by machine screws throughout, no solder being used. The Tubaphone is made with one, two, three or four tubes, and finished in oxidized brass, plain polished brass or nickel. The horn can be adjusted to give a clear tone with any engine having from one to eight cylinders.

WASHING OUT DEPOSITS.—A preparation for washing out deposits of lime and the like from the water jackets, radiators and water piping of automobiles has been placed on the market by Louis Ohnhaus, of 219 West Pearl street, Fort Wayne, Ind., under the trade name of Hydrolime. The preparation softens water in which it is put and is non-corrosive and also anti-corrosive, it being stated that ordinary nails will not rust when wet with water in which Hydrolime has been dissolved. The compound is stated to be absolutely harmless.

DIMINUTIVE AUTOMOBILIST.—Quite in keeping with the modern idea of making advertising matter as artistic and attractive as possible is the ten-color lithograph just issued by Morgan & Wright, of Chicago, Ill., manufacturers of tires. The picture

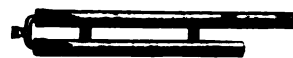


WANT TO TAKE A RIDE ON GOOD TIRES?
NEW MORGAN & WRIGHT POSTER.

represents a little chap rigged up in full automobiling regalia, goggles and all. Interest in the picture is increased by the fact that the original was really a human boy—the little son of President Butler, of the Morgan & Wright concern. The picture will be sent free to automobilists on application.

SPECIAL BALL STEEL.—A specially treated steel is now being used by the Standard Roller Bearing Co., of Philadelphia, Pa., in the manufacture of steel balls for bearings. These balls are said to be much stronger and more durable than those made of ordinary steels, and they are guaranteed to be true in diameter and in sphericity to one ten-thousandth part of an inch. The fracture is said to show a much finer grain than crucible ball steel. Tests of steel balls have been made by the Standard Company and the results are given as follows: A half-inch ball of ordinary steel will crush under a pressure of about 25,000 pounds, while the new "Standard alloy" balls require a pressure of from 45,000 to 50,000 pounds to crush them. An ordinary ball five-eighths of an inch in diameter crushes at about 39,000 pounds, while a new Standard ball of the same diameter crushes at 65,000 to 70,000 pounds. Three-quarter inch balls crush at 56,000 pounds for ordinary steel and 85,000 to 100,000 pounds for the new steel.

BABY GABRIEL.—A new sound producer, under the name of the Baby Gabriel Horn, has been placed on the market by the Gabriel Horn Mfg. Co., of Cleveland, O. This horn is intended for motorcycles and small power boats, and is similar to the regular



A BABY GABRIEL HORN.

exhaust-blown Gabriel horns with two tubes except that it is smaller, the space occupied being 2 inches wide and 15 inches long. The baby Gabriel is furnished complete with valve and spring for attachment.

LEON RUBAY, 140 W. 138th street, New York.—Catalogue of imported Lacoste ignition apparatus; for which this concern is sole United States agent. The catalogue is an unusually complete one and gives many interesting details of the apparatus. French horns, lamps and other specialties are also listed.

INDEX TO ADVERTISERS

A	
Acetylene Gas Illuminating Co.	32
Acme Motor Car Co.	80
Add-Wear Tire Sleeve Co.	44
Aerocar Co.	88
Am. Anti-Puncture Tire and Auto Co.	38
American Coll. Co.	32
American Generator Co.	52
American Motor Truck Co.	79
American Shock Absorber Co.	55
American Veneer Co.	42
Anderson Forge & Machine Co.	36
Arc Spark Mfg. Co.	60
Archer & Co.	32
Artisan Brass Co.	51
Ashton Valve Co.	31
Aster Co., L.	39
Atwood Mfg. Co.	81
Auburn Automobile Co.	82
Auto and Power Appliance Co.	53
Auto Chimes Co.	44
Auto Pump Co.	36
Auto Safety Starting Crank Works.	30
Auto Top and Equipment Co.	37
Automobile Equipment Co.	41
Automobile Supply Co.	32
B	
Badger Brass Mfg. Co.	49
Baker Motor Vehicle Co.	78
Baldwin Chain Mfg. Co.	55
Beaver Mfg. Co.	63
Bemus, T. Alton.	50
Berkshire Automobile Co.	Cover
Beverley Mfg. Co.	36
Blasler Mfg. Co., M. E.	37
Blomstrom Motor Co., C. H.	43
Blue Book	35
Boker & Co., H.	32
Borbein & Co., H. F.	37
Boston Mechanical Co.	31
Bowser & Co., S. F.	55

Boyle & Co., John.	56
Brennan Motor Co.	40
Briscoe Mfg. Co.	38
Brown & Co., S. N.	37
Brown, R. E.	58
Brown, W. H.	60
Brownell-Trebert Co.	39
Buckeye Mfg. Co.	89
Bullard, J. H.	45
Buob & Scheu.	27
Byrne-Kingston Co.	70
C	
C. B. & Q. Ry. Co.	51
Cadillac Motor Car Co.	84
Central Garage	38
Capitol Foundry Co.	38
Chalfonte Hotel	56
Champion Co., A.	32
Champion Mfg. Co.	52
Chase & Co., L. C.	32
Chelsea Clock Co.	57
Chicago, M. & St. P. Ry.	30
Clark, E. P.	41
Cleanola Co.	32
Cleveland Motor Car Co.	85
Coates Clipper Mfg. Co.	49
Collins & Sons, G. A.	37
Columbia Lubricants Co.	54
Commercial Vehicle	74
Connecticut Steel & Wire Co.	31
Connecticut Tel. & Electric Co.	30
Continental Caoutchouc Co.	71
Continental Motor Mfg. Co.	40
Cooper-Hewitt Electric Co.	49
Coops Co., C. W.	37
Corbin Motor Vehicle Corporation.	86
Covert Mfg. Co.	31
Crawford Automobile Co.	78
Cullman Wheel Co.	36
Cushing, J. M.	54
D	
Dayton Electrical Mfg. Co.	69
Deere-Clark Motor Co.	79
Detroit Auto Vehicle Co.	83
Detroit & Buffalo Steamboat Co.	39
Diamond Chain & Mfg. Co.	38
Diamond Rubber Co.	75
Lietz, R. E.	45
Diezemann Shock Absorber.	50

Dixon Crucible Co., Joseph.	41
Dominick Co., Wm.	64
Dorris Motor Car Co.	78
Dover Stamping & Mfg. Co.	33
Dow Portable Electric Co.	38
Duff Mfg. Co.	59
Duplex Coil Co.	47
Duplex Ignition Co.	52
Duquesne Construction Co.	32
E	
E. H. V. Co., The.	82
Eastern Carbon Works.	54
Eclipse Buggy Co.	37
Edmunds & Jones Mfg. Co.	31
Edwards, J. H.	30
Eldredge Electric Mfg. Co.	30
Electric Rubber Mfg. Co.	38
Electric Vehicle Co.	82
Electrical Mfg. Co.	31
Elmore Mfg. Co.	87
English Daimler Co.	47
English & Mersick Co.	32
Erie Railway	39
Excelsior Supply Co.	30
F	
Fairmount Engineering Works.	31
Fisk Mfg. Co.	63
Ford Motor Co.	31
Forest City Motor Car Co.	78
Fox Reversible Engine Co.	54
Franklin Mfg. Co., H. H.	77
Franklin Portable Crane & Hoist Co.	47
Frayer-Miller Motor Car Co.	44
G	
G & J Tire Co.	76 and Cover
Gabriel Horn Mfg. Co.	69
Garage Equipment Co.	31
Garford Co., The	53
Gilbert Mfg. Co.	25
Glover, George H.	23
Goodrich Co., B. F.	73
Goodyear Tire & Rubber Co.	73
Gramlich Chemical Co.	31
Grand Hotel	56
Gray & Davis.	Cover
Gray-Hawley Mfg. Co.	31
Haddon Hall	57
Ham Mfg. Co.	68
Hardy Co., The R. E.	31

THE AUTOMOBILE

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NEW YORK—THURSDAY, MAY 24, 1906—CHICAGO

No. 21

THE SPEED PARADE OF THE LONG ISLANDERS

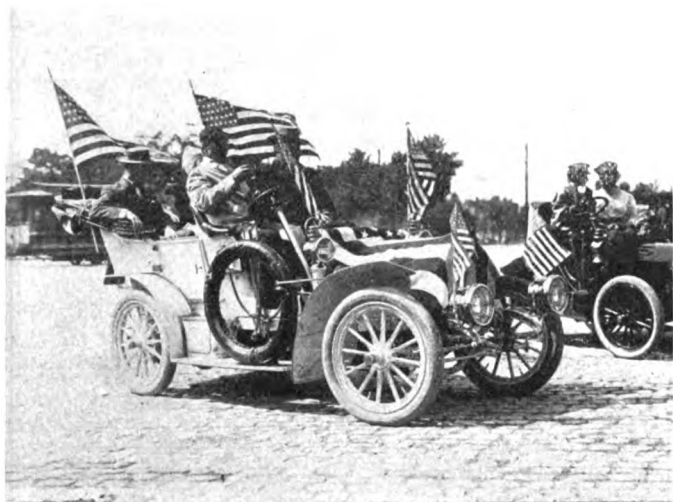
EXACTLY how it all happened stories differ much, but the fact remains that the 1906 parade of the Long Island Automobile Club, held Saturday afternoon, May 19, resolved itself with startling unanimity into a wild rush for the sea when the cavalcade reached the tempting Coney Island Boulevard. According to the *Brooklyn Eagle* the driver of a blue car started the

route of the 140 cars, the greater part of which indulged in the scramble for Coney's wave-washed strand.

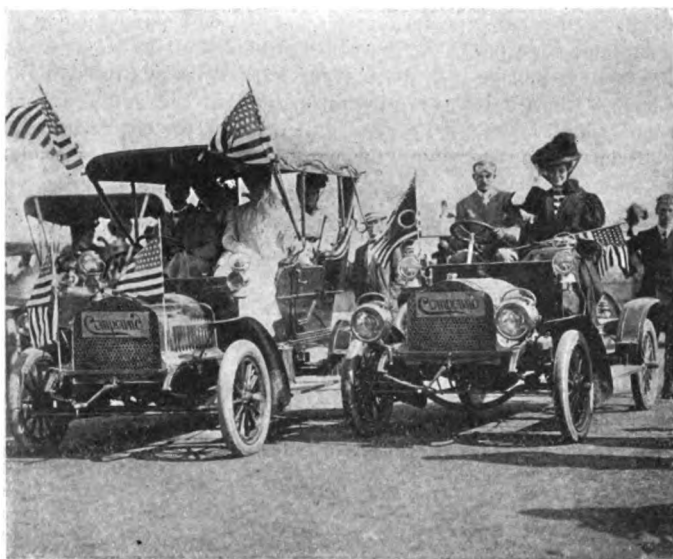
The assemblage took place at the Park Plaza in Brooklyn Borough. Charles Jerome Edwards figured as the grand marshal, and behind him came Dr. W. T. Richardson, the chairman of the special committee having the parade in charge, with President



HOW THE ASSEMBLED CARS AT PARK PLAZA LOOKED FROM THE TOP OF THE MEMORIAL ARCH.



A LOCOMOBILE PARTICIPANT OF THE SPEED PARADE.



TWO COMPOUND CARS DRESSED FOR THE OCCASION.

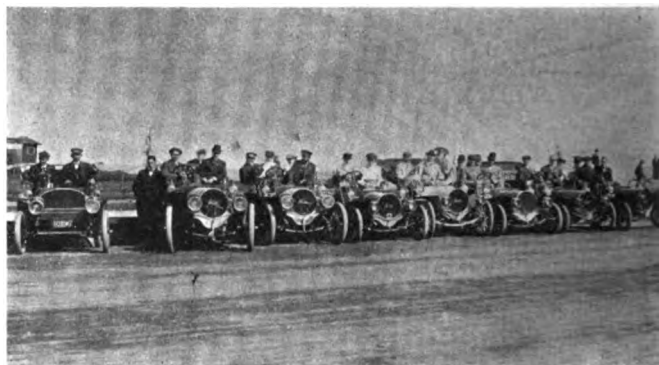


THE VIOLA BOWLING CLUB IN THE BIG 'BUS.

Alfred Wilmarth alongside in another car. Both autos were gay with bunting, and the doctor's car contained two buglers, who blatantly told of the coming of the Long Islanders and their guests.

It was an orderly procession that started down Eastern Parkway and into Bedford avenue, the route thence covering various streets and finally leading to the west driveway of Prospect Park. At the head of the motorcycle police were supplying a pace that must have been a bit faster than eight miles an hour, and going through the park it is not improbable that many, owing to the lively clip, failed to appreciate its beauty. It was at the beginning of the Coney Island Boulevard, after the exit from the park, that the blue car began the trouble. Grand Marshal Edwards tried to stem the tide, but it was a useless attempt, for the fever spread on the high speed, and in a moment they were off for the sea. One might as well have tried to stop the fall of Niagara as to have blocked the whirling paraders. Though only 141 cars started, a dazed policeman statistically gave a total that was more than trebled.

There was to have been some prize giving before the disbandment at Coney Island, but the unannounced race greatly disturbed the plans of the committee. A prize for the largest number of cars of a particular make probably belonged to the Cadillacs, over thirty of this kind being in line. The Royal Tourists claimed twenty-two machines, and there were many Autocars, Franklins and Whites; in fact, all the prominent makes and many



A GOODLY LINE-UP OF AIR-COOLED FRANKLINS.

of lesser importance were on view. A brand new vehicle was a steam runabout built by C. A. Ball, a Brooklynite, who constructed it for his own pleasure. It possessed a four-cylinder compound engine with a flash boiler, and it is claimed that it can burn either kerosene or gasoline.

Of the decorated machines, the Cadillac of Mr. Edwards, the Royal Tourist of Dr. Richardson, President Wilmarth's similar car and the Autocar of M. G. Wolfe were eligible for prize competition. A feature of the parade was the big Mack 'bus, which contained fourteen women members of the Viola Bowling Club, all of whom were garbed in white, with violets used for contrast. The Columbia of N. W. Curtis, with the women of the party also dressed in white, presented an attractive picture, with a decorative scheme that combined wistaria, white lilacs and carnations, and lavender ribbons.

The Franklin exhibit included a 1902 model of the four-cylinder type, said to be the first built in this country, and having to its credit an 85,000 mileage.

Though things did not come out exactly as the committee desired, the 1906 parade of the Long Island Automobile Club will be long remembered, especially the race which it supplied down the Coney Island Boulevard. Formed in 1900, with such veterans as A. R. Pardington and Frank G. Webb at the helm, the Long Island Club has grown until it now figures among the largest in the country and possesses a clubhouse and garage at 360 Cumberland street, Brooklyn, which it is outgrowing with rapid strides. The club has been prominent in A. A. A. matters and

helped to bring about the organization of the national body. As a member of the New York State Association the club has been very active in Albany legislative matters. A misunderstanding among some of the leaders in reference to the Stanley bill caused a story to the effect that several of the old timers intended to resign and bring forth another club. Explanations and conferences have about smoothed the strained situation, and indications now are that the Long Islanders will hardly care to put themselves in the position of antagonism to all the other New York state clubs. The impression now generally prevails that though the Stanley bill contained some excellent ideas, it were better to leave things as they are for another year.

THE PARADE OF THE JERSEYMEN.

The Automobile Club of Hudson County, Saturday last, held its annual parade in a most successful manner, over 200 automobiles, many of them handsomely decorated, parading the Hudson County Boulevard from Montgomery street, Jersey City, to Bergen Point, a distance of eight miles. Thousands of people saw the spectacle, which was in charge of President J. A. Edwards, Henry Louderbough, J. V. Z. Anthony and Frank Whitney. At Bergen Point the members of the club and their guests were entertained at luncheon. Unlike the Brooklyn event, there was no scorching, and none attempted to run ahead of the band wagon.

The Automobile Club of Hudson County is in a most prosperous condition, having increased in numbers until it is now beyond



THE CONEY ISLAND BOULEVARD WAS TEMPTING.



A FORMIDABLE STRING OF WHITE STEAM CARS.

the one-hundred mark. Recently it has been doing some energetic work in connection with discouraging speeding on the Hudson County Boulevard, a matter that had become a source of great complaint to other users of the boulevard.

PHILADELPHIA'S TWO-TAG NUISANCE.

PHILADELPHIA, May 21.—The much-abused Quaker automobilists do not propose to suffer silently under the inconvenience—not to mention the expense—imposed upon them as a result of the recent ruling of the Pennsylvania Supreme Court requiring them to decorate their vehicles with a city tag in addition to that issued by the State. They propose to make an effort to induce the City Councils to so amend the municipal ordinance as to make the exhibition of a city tag unnecessary when a State tag is carried—this because of the clause in the State law which makes it illegal to carry any but a State tag on one's machine.

Last week President Dick, of the Automobile Club of Philadelphia; Robert P. Hooper, treasurer of the Automobile Club of Germantown, and other prominent officials of the two local clubs, had many Council members out in their cars for the purpose of demonstrating the absurdity of strictly enforcing the tag requirement of both city and State. Roads were selected which crossed the line between Philadelphia and Montgomery counties, and the rapid changes necessary to keep within the law were laughable. It is certain that the proposed ordinance will be adopted next week.



A QUARTETTE: RICHARDSON, PIERSON, EDWARDS, WILMARTH



THE MEMORIAL ARCH AT PROSPECT PARK ENTRANCE..

HOLDS OWNER IF IN AUTO.

BOSTON, May 21.—A decision of great importance to owners of automobiles in Massachusetts has been handed down by the full bench of the Supreme Court. It is in effect that whoever participates in the overspeeding of an automobile is liable criminally, the court holding that if the owner or anyone having control of a car knows and allows it to run illegally he is equally liable with the chauffeur.

The decision was made on the test case of the Commonwealth against Roland H. Sherman. Mr. Sherman is a lawyer and the son of Judge Sherman, of the Superior Court, and the case is the outgrowth of his arrest in Leicester for driving his car more than twelve miles an hour, the limit allowed in that town. He was found guilty in the Worcester District Court and appealed his case. In the Superior Court Mr. Sherman was found guilty by a jury, but he contended that he could not be convicted on the proof submitted, and appealed his case to the Supreme Court for a determination of the law. It was agreed that the automobile was registered with the Massachusetts Highway Commission by Mr. Sherman and in his own name; that he was in the automobile, which was going in excess of twelve miles an hour, the maximum speed permitted by the Leicester town by-laws; and that he was one of five people in the car, was not himself operating it, but was seated in the tonneau.

The court holds that the proof was sufficient. It says the automobile was registered with the Massachusetts Highway Commission by the defendant, and in his own name, warranting a finding that he was the general owner of it or that he had a special property therein which gave him control thereof. Under the statutes automobiles shall be registered by the owner or person in control thereof. The court holds that if he is guilty here, he is not guilty as owner but because the evidence warranted the jury in finding as a fact that he participated in the machine's being run at an illegal speed. The court says the offense with which he stands charged is a misdemeanor and not a felony, not being punishable by imprisonment. If it be material, the court says it is settled that in misdemeanors there are no degrees, but that all who participate in the commission of the offense are principals, and may be charged as such. The court holds that the Commonwealth made out a *prima facie* case of participating by the defendant in the machine's being run at an illegal speed, by showing that the machine was being run by the operator at an illegal speed, while the defendant, being either the general owner of the machine or having a special property in it that gave him the right to control it, was in the tonneau. The court holds further that the facts warranted the inference that the defendant knew and allowed his machine to be run illegally. The case is a *prima facie* case only, and may be contradicted or explained. But uncontradicted or explained, it does warrant that inference and so makes out a *prima facie* case, says the court.

INSPECTOR CRITICISED SAFETY VALVE PLAN.

OMAHA, NEB., May 21.—An unusual automobile accident occurred at Omaha recently when the boiler of a Stanley steam touring car exploded while the car was moving on Farnam street, near Central boulevard. The detonation was terrific, and was heard for more than a mile. Windows in the immediate vicinity were broken, and parts of the machine were found three blocks away. Of the six persons in the car only two were more than nominally injured—H. A. Perkins, commercial agent for the Rock Island railroad at Omaha, and the chauffeur, R. C. Forberd. The other occupants, two men and two women, were only slightly bruised. The time of the accident was 10:25 at night, the party being on the way home from the Field Club. The car was a rented one belonging to the R. R. Kimball garage of this city. The boiler head was blown out, but the cylinders were not

ruptured. The boiler in the Stanley steamers is well forward and the force of the concussion was away from the car. This accounts for the light injury to the occupants. Mr. Perkins and the chauffeur were hurled some distance, alighting on their hands and knees. They were bruised, burned, and their eyes filled with sand and asbestos. The cause of the accident has not been made plain, or at least not made public. City Boiler Inspector Scheid, after an inspection of the shattered parts, criticised the safety-valve arrangement, which, he says, permits steam to condense in the pipe through which it runs to the valve in order to render blowing off inoffensive to the occupants. He thinks the water causes the valve parts to rust and become inoperative unless given frequent attention. He thinks also that the diaphragm of the automatic fuel-feed device possibly became defective, causing the generation of excess steam.

The accident caused much interest throughout the city and revealed the fact that the city ordinances are mute as to automobile boiler inspections. This will probably be corrected soon. Another result will be better care and closer attention to the working parts of the cars in the local garages. From expressions heard it seems likely that the explosion will check the local sale of Stanley cars, which heretofore have been popular in Omaha.

MEGARGEL HAS REACHED CHICAGO

CHICAGO, May 19.—Percy Megargel, the transcontinental automobilist, arrived at Riverside, Ill., this afternoon at 4 o'clock, after traveling 10,636 miles. He was met at Riverside by several members of the Chicago Automobile Club, who escorted him into Chicago. He left Aurora at 9 o'clock this morning, but his machine broke down when he had gotten about two miles out of the city and he had to return for repairs. Megargel will resume his journey eastward early in the week, and expects to make good time between Chicago and New



MEGARGEL AT THE REO WHEEL.

York, though he will not attempt any record driving. He will make short stops at the larger cities along his route.

MISSOURI FOR THE MAIN ROAD.

JEFFERSON CITY, Mo., May 21.—Thirty county judges, lawyers, and business men, chosen by the Missouri good roads convention, recently called upon Governor Folk and asked him to issue a call for a special session of the Legislature to take up the matter of adopting steps for the speedy improvement of the roads in the State. The governor said he would give his reply in a few days. It was the plan of the committee which saw the governor to have the Legislature draw up a constitutional amendment, which can be submitted to the voters in the November elections, permitting a levy of 10 cents for road purposes. If this amendment is submitted in November and carried, some relief from the present intolerable conditions can be had within twelve months, while if the matter is delayed until the regular session of the Legislature in 1907, three years must pass before work can begin.

Missouri wants to be on the route of that transcontinental highway, which is no longer a vague dream, and the State wants to get ready for the national way by first making its own roads good.

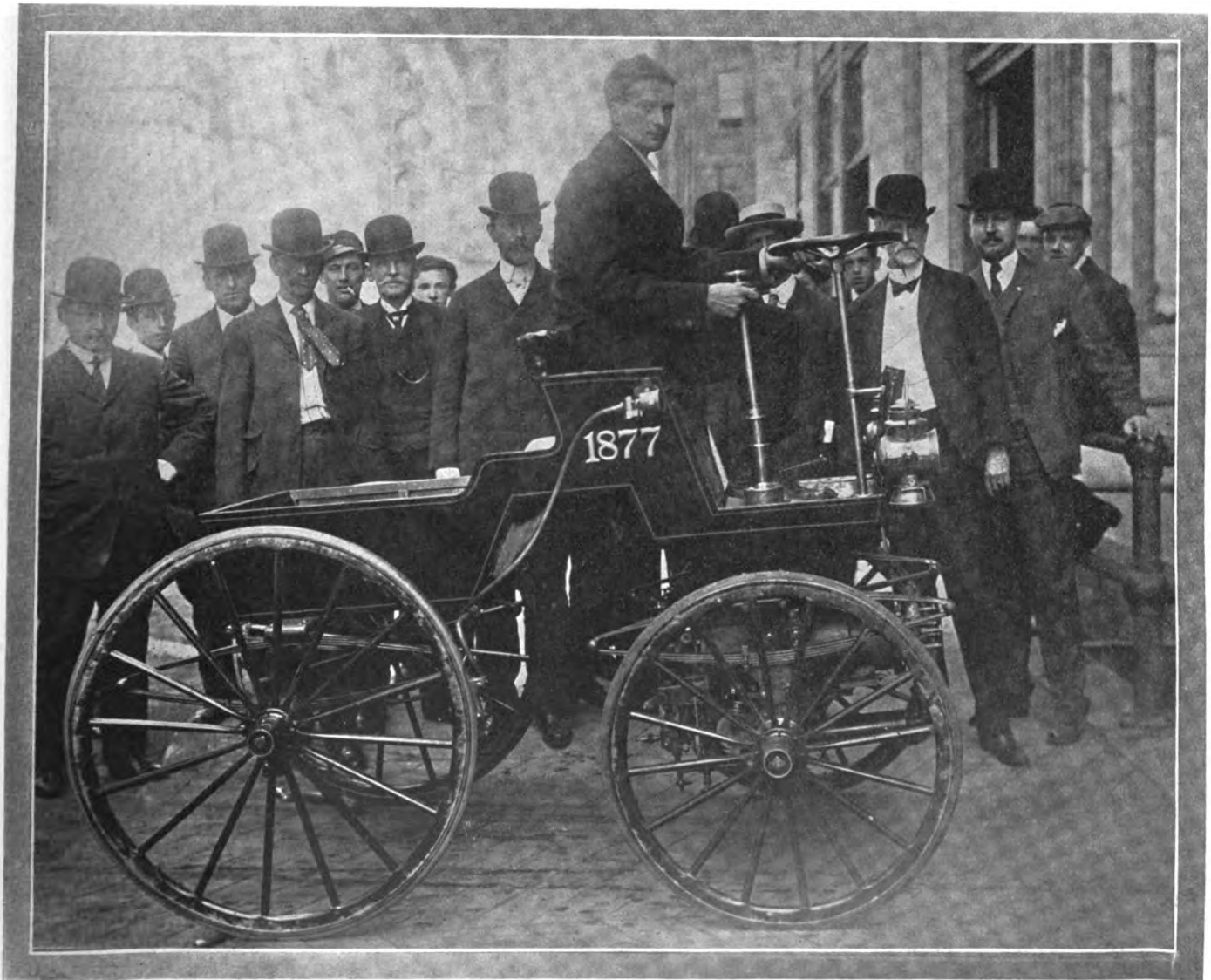
LEGAL LIGHTS INSPECT THE SELDEN MOTOR

IT was a formidable array of legal talent, famous in the annals of patent litigation and fortified with the knowledge begot of wide experience, that gathered at the garage of the Decauville Automobile Company, Broadway and Fifty-sixth street, New York City, at high noon, Saturday, May 19. The meeting was arranged by counsel for the opposing sides in the suits now pending involving the Selden patent, the purpose being the examination of the original Selden motor and observation of its operation. George B. Selden, the patentee, accompanied by his sons, Henry R. and George B. Selden, Jr., were present, together with personal counsel, the Hon. George Raines of Rochester, and the A. L. A. M. was represented by W. A. Redding and Samuel R. Belts as counsel, S. T. Fisher, ex-assistant Commissioner of Patents, and H. F. Cunz. The defendant Ford interests were represented by R. A. Parker of Detroit as counsel, who was accompanied by Prof. Carpenter of Cornell University and Jesse Smith of New York, as experts.

The car was operated by the younger Seldens, and all interested parties so desiring were given a ride around the garage

floor. The body and wheels of the car are new fittings, but the motor was made in 1877. Patent was not applied for by Mr. Selden until 1879, and same was not granted by the Patent Office until 1895. As a patent has 17 years to run, its limitation is six years hence, in 1912. The Selden car complete weighs 700 pounds, is four feet between wheels, which are 32- and 38-inch front and rear respectively. The motor is of the two-cylinder type, having three horizontal cylinders, with independent compression, and capable of a varying speed of from 100 to 500 revolutions per minute. The present ignition is jump spark.

Owing to the vast and varied interests involved in the present litigation, the demonstration by the original motor was one of particular interest. It was a part of the regular accumulation of evidence which is being taken before U. S. Commissioner John A. Shields, and which will be presented by him to the United States Court in October for a finding. Not until then will be learned what all the students of the Selden auto thought of its operation. The representatives of the opposition were not inclined to express an opinion on the matter last Saturday.



THE SELDEN CAR AS IT APPEARED AT THE DEMONSTRATION GIVEN TO THE PATENT EXPERTS.

George B. Selden, the inventor, is the man with the gray moustache standing partly to the rear of the body of the car. He can be distinguished by the watch chain on his vest. Henry R. Selden is at the wheel, and W. A. Redding and H. F. Cunz are at the right of the picture. The Hon. George Raines is behind the steering wheel, only his straw hat showing.



MAURICE FOURNIER, BROTHER OF HENRY, DRIVER OF A CLEMENT.



CAGNO, DRIVING THE WINNING ITALIA, NEAR CERDA.

CAGNO'S TARGA FLORIO VICTORY.

PALERMO, May 8.—Italy has had the honor of organizing and the glory of winning the first great automobile event of the season. The scene of the victory was the island of Sicily; the nature of the battle, a 282-mile run round a difficult circuit on touring machines; the victor, Cagno, on an Itala machine, and the promoter of the affair, Chevalier Florio.

At 5 o'clock on Sunday morning, May 6, everything was in readiness and large crowds were at the starting point. The nature of the race was somewhat of a novelty, being a speed test for touring cars under racing conditions, the regulations merely specifying that all chassis must be the ordinary serial construction of the firm, and catalogued at not more than \$4,000. On every other point the builders were given full freedom, and it was thus that there were to be found side by side at the starting line modest 20-horsepower cars and monsters with 60-horsepower under their bonnets.

Promptly at 6 o'clock the first car was sent away; it was Lancia, on a Fiat, who had been designated by the drawing of lots to set the pace. Ten minutes later Le Blon, on a Hotchkiss, made a good start. The French driver was handicapped by having a four-seated body, the other competitors only having a two-seater. His wife was on board with him, acting as mechanic. Cagno, on an Itala, went away in splendid style, followed by Achille Fournier, on a Bayard-Clément, and Bablot, on a Berliet machine of Lyons construction.

Pope, the Englishman, lighted a cigar for his little run on the Itala. Maurice Fournier, replacing Lebellier, followed half an hour after his brother, also on a Bayard-Clément. Baron de Caters, who had abandoned the *Seasick* for the moment, stood true to Itala and piloted his land machine as cleverly as he had handled his seagoing racer. Rigal and Graziani, both Itala champions, brought up the rear.

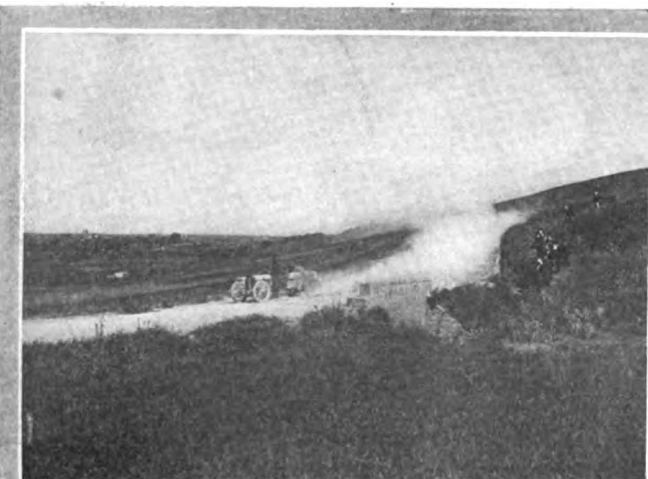
The first to start, Lancia was the first man to finish the round, but he was followed closely by his younger rival, Cagno, on his Itala, and when allowance had been made for the starting time, it was found that Cagno was first and Lancia second.

At the end of the second round Cagno was not only still leading, but had shaken his most formidable rival, Lancia, down to sixth place.

With the third round interest increased, for, though the match now lay almost entirely between the Itala representatives, there was still a formidable competitor in the French Berliet. At last the trumpet call was heard, and Cagno rushed by in 9 hrs. 32 min. 22 sec.

1. Cagno (Itala)	9:32:22
2. Graziani (Itala)	10:05:32 1-5
3. Bablot (Berliet)	10:20:05 1-5
4. Rigal (Itala)	10:25:08 4-5
5. De Caters (Itala)	10:38:26 1-5
6. Le Blon (Hotchkiss)	12:09:23

Lancia was unable to finish the last round, owing to a leaking gasoline tank.



LANCIA, THE SPECTACULAR FIAT DRIVER, IN ACTION



RIGAL, ANOTHER ITALIA DRIVER, PASSING FINISHING STAND.

ON THE BASIS OF COST PER TON-MILE

IN the Second Annual National Economy Test of the New York Motor Club the awards will be made on the basis of cost per ton-mile. This feature eliminates all classification, and every car entered, no matter what its price or power, so long as it be a touring car or runabout, has a chance to win. This contest will stand in a distinctive class as an exposition of what can be accomplished in the art of passenger carrying by automobile, with minimum cost for operating. Aside from the value of the test as a commercial factor, the pleasure to be derived from a competition of this character is practically unlimited, as the route leads through one of the most charming sections of the country, up the banks of the Hudson river to Albany, through the Berkshire Hills in western Massachusetts, down the Connecticut valley to Middletown, across the base of the foothills to New Haven, and thence to New York by the south shore of Long Island Sound, a distance of 430 miles.

A gold and a silver cup and a bronze medal are offered by the club for the cars making the three best records. And certificates of awards will be given to all competitors who finish. A pilot car will be used to distribute confetti along the road and, in addition, complete running directions will be furnished all drivers. The test is in charge of the contest committee of the club, Harry Unwin, chairman, assisted by the technical committee, and will be under the supervision of a competent board of officers.

The entry fee is \$100 and entries close with A. B. Tucker, secretary of the club, 31 West Forty-second street, at noon of Saturday, June 16. It is confidently expected the entry list this year will be a very large one, a prediction indicated by inquiries already received.

The following are essential extracts from the rules as formulated in the official entry blank:

Rules and Conditions of the Contest.

1. The Second Annual National Economy Test shall consist of three runs, as follows: New York City to Albany, N. Y., about 150 miles; Albany to Springfield, Mass., about 131 miles; Springfield to New York City, about 149 miles. Total distance, about 430 miles.

The test shall take place on June 20, 21, 22, 1906, one day being devoted to each run in the order stated.

Object and Basis of Charges.—2. The object of the Test shall be to prove the economy of operating motor cars. 3. The basis of comparative charges as against railway transportation for the entire test shall be as follows:

Passengers:	1	2	3	4	5	6	7
New York to Albany	\$3.10	\$6.20	\$9.30	\$12.40	\$15.50	\$18.60	\$21.70
Albany to Springfield	2.95	5.90	8.85	11.80	14.75	17.70	20.65
Springfield to N. Y.	2.98	5.96	8.94	11.92	14.90	17.88	20.86

Totals \$9.03 \$18.06 \$27.09 \$36.12 \$45.15 \$54.18 \$63.21

Basis of Awards.—4. (a) The awards shall be made on the basis of cost per ton-mile. After a most careful consideration of methods of classification and handicapping, as employed in previous contests, the committee has unanimously agreed to award all prizes on the basis of the total cost per ton-mile. This eliminates all classification, giving each car an equal chance to win. No handicapping is required.)

(b) The basis of the cost per mile computation is as follows: The total weight of the car, passengers, baggage, extra parts and equipment, in tons and fractions, is multiplied by the miles traveled, giving what is known as "ton-mile." The total cost or charges against each car as provided in Rules 34 and 35, when divided by the ton miles traveled, gives the average cost per ton-mile. Total cost shall mean the sum of all charges against each car as laid down in these rules, including gasoline, oil, repairs, adjustments, new parts, tires, fines, tolls, storage, etc.

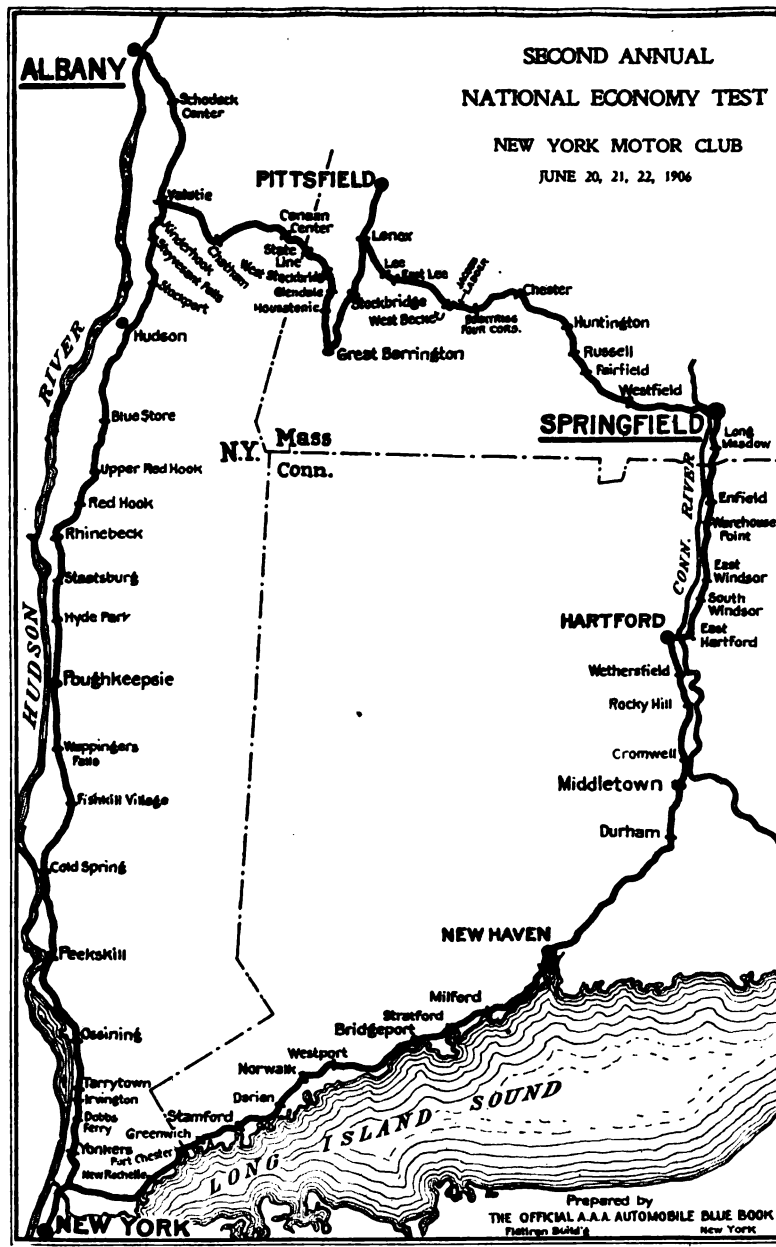
Prizes.—5. The prizes for the Second Annual National Economy Test shall be as follows: First prize, a silver cup; third prize, a gold cup; second prize, a bronze medal; each to become the absolute property of the winner. A certificate of award will be given to each car completing the test under these rules.

Routes and Schedule.—6. The routes shall be: To Albany by way of Yonkers, Irvington, Tarrytown, Ossining, Peekskill, Cold Spring, Fishkill Village, Wappingers Falls, Poughkeepsie, Hyde Park, Staatsburg, Rhinebeck, Red Hook, Hudson, Kinderhook, Valatie, Schodack Center.

To Springfield by way of Schodack Center, Valatie, Chatham, New Canaan, Canaan Center, State Line, West Stockbridge, Housatonic, Great Barrington, Stockbridge, Lenox, Pittsfield, back to Lenox, Lee, East Lee, West Becket, Bonnyrigg, Four Corners, Chester, Huntington, Russell, Westfield.

To New York by way of East Long Meadow, Enfield, Warehouse Point, East Hartford, Hartford, Wethersfield, Rocky Hill, Cromwell, Middletown, Durham, New Haven, Milford, Stratford, Bridgeport, Norwalk, Stamford, Greenwich, Port Chester, New Rochelle.

Direction of Test.—9. The test shall be held under the direction of the Contest Committee, Harry Unwin, chairman, and the fol-



Prepared by
THE OFFICIAL A.A.A. AUTOMOBILE BLUE BOOK
Fittsboro, N.Y.

lowing officials: A referee, a superintendent of garages, a superintendent of observers, a quartermaster, and a chief inspector.

Entries.—10. Four-wheeled automobiles of any price and power, of the types known as touring cars and runabouts shall be eligible to compete.

11. The entry fee for all cars shall be \$100, payable at the time of making the entry.

13. (a) Entries, with fees, shall be forwarded to A. B. Tucker, secretary of the New York Motor Club, Room 301, No. 31 West Forty-second street, New York City. (Telephone 5492 Bryant.)

(b) Checks, etc., for entry fees shall be made payable to R. H. Johnston, treasurer of the New York Motor Club.

18. Every entry, if made by a manufacturer or his representative or agent, shall be with an understood guarantee to accept all orders at the entry price from all persons for exact duplicates of the vehicle or part thereof, entered for the test, which may be given on or before July 1, 1906, and to deliver all such vehicles, or parts so ordered, in perfect working order on or before October 1, 1906, provided a cash deposit not exceeding one-third the price of the vehicle is paid at the time of giving the order. Should the manufacturer or his representative or agent fail to comply with such guarantee, he may, at the discretion of the club, be disqualified from taking in any event organized by the club for a period not exceeding one year from the date when the club may decide to disqualify him.

Legal Equipment and Signs.—20. Every vehicle entered shall bear registry number plates of one of the States of New York, Massachusetts or Connecticut, and shall be registered in the State the number of which it bears.

Start and Finish of Runs.—23. Vehicles shall begin each day's run between the hours of 6 and 9 a. m., and shall arrive at their daily destination in the official garage between the hours of 4 and 10 p. m.

Weighting.—24. Each vehicle, with its full complement of passengers, baggage, extra parts and equipment, shall be weighed at the start and finish of each day's run at such places as shall be designated by the Committee. Failure on the part of the driver to comply with this rule shall result in disqualification.

Observers.—25. Every vehicle shall carry an official observer, for whom a front seat shall be reserved, and cars shall be under observation continuously, from the time of their delivery into the hands of the committee until the close of the test, either by the observers on the car or the superintendent of garages or his assistants.

26. Entrants must nominate one observer in respect to each car entered by them. The name of such observer must be submitted to the committee not later than 12 o'clock noon, Saturday, June 16, 1906, and preferably at the time the entry is made.

27. Observers nominated should be practical men, preferably engineers, designers, constructors, factory superintendents, managers or agents. Each should have driven an automobile and each should be familiar with all the general details of gasoline or steam car construction. Each must know the rules of the road and the current automobile laws of the States of New York, Massachusetts and Connecticut. Each must be familiar with the rules of this Test.

28. No person so nominated shall act as observer upon a car of the same make as that of his nominator. The club reserves the right to reject the name of any nominee for the position of observer without giving reasons therefor.

29. Each observer will, so far as practical, be placed on a different vehicle each day. He must not in any way assist drivers of cars; for instance, he must not turn on lubricators or perform any function, however small, in connection with the car. He must not assist drivers with suggestions. He must in all cases act impartially as the representative of the club. The only exception to this rule is that, in the case of cars carrying only two persons, the observer may, if he thinks fit, and is requested to do so by the driver, assist in repairing tires, but under the two cents per minute rate provided for in Rule 35.

33. Each observer shall remain with his car from the start each day until its arrival at its destination, and he shall formally turn the car over into the hands of the superintendent of garages or his assistants. He shall receive the appointed car from the garage officials in the morning. Should the driver of the car declare himself out of the test at any point during a day's run, the observer shall go by train to the stopping place for that night.

Observers' Reports.—34. Each observer shall make report, on cards given him for that purpose, of the weight of the car at the start and finish of each day's run; of the time consumed in making all repairs, adjustments, and replenishments; the reason thereof; the name of the part or accessory used; each purchase and replenishment of oil and gasoline; the quantity thereof; the employment of any other than the driver of the car; the time of such employment; the amount paid out by the driver or other person for anything in connection with the car, including mechanical help, tows, tolls, ferry charges, fees, fines, storage, etc. These reports shall be made whether or not the car is stopped for the purpose reported.

35. Observers shall report charges as follows: Storage at Albany and Springfield, one dollar (\$1.00) per night; gasoline, twenty cents (\$.20) per gallon; lubricating oil, ten cents (\$.10) per pint or fraction thereof; time of all repairs, adjustments, or replenishments, one cent (\$.01) per minute for the driver and two cents (\$.02) per minute for each and every other person employed. This rule shall include all work done in connection with tires.

38. Immediately after turning the car over to the superintendent of garages, the observer shall report each day to the superintendent of observers, and shall file his report in due form for the day, remaining until all points upon it are made perfectly clear and making affidavit to its correctness, if required.

Drivers.—39. A vehicle shall be driven by one person, the nominated driver, throughout a day's run, unless he shall be incapacitated, when his place may be taken by a substitute, by permission of the observer, the same being duly noted on the report.

40. Drivers must be familiar with the rules of the road, and the current automobile laws of the States of New York, Massachusetts and Connecticut. Each must be familiar with the rules of this test. Each must be familiar with the speed limits in all territory traversed. Each must observe speed limit regulations. Fines after arrest for breaking speed limit regulations shall be charged against the car. The act of fining is considered to establish blame on the part of the driver in so far as this test is concerned.

Garages.—42. All cars must be turned over to the superintendent of garages not later than 9 a. m., Tuesday, June 19, 1906. All tanks and lubricators must be filled not later than 12 o'clock noon of that day, in the presence of the observer appointed for Wednesday, June 20.

43. From the time a car is delivered to the superintendent of garages until it is taken out, no person except the driver, in the presence of his observer, shall be permitted to approach the car for any purpose whatever.

Occupants of Cars.—44. No extra occupants shall be carried beyond the capacity for which the car is designed, based on two passengers for the front seat (driver and observer), and for the tonneau seat or seats, one passenger for each fifteen (15) inches, measuring at widest part of top of seat cushion. Occupants shall not be allowed to ride on the floor or step nor on emergency seats.

Road and Running Regulations.—46. Cars must be driven with due regard to the rights of other users of the highways, and with consideration for horse-driven vehicles and pedestrians. Violations of this rule, if wilful, and, in the Committee's opinion, tending to bring motor cars into popular disfavor, shall result in disqualification.

Disqualification.—49. Disqualification may be made of any vehicle entered for the violation of these rules, upon notice, by the referee, and after the driver of the vehicle in question shall have been notified of the charge.

Protests.—51. Any competitor who wishes to lodge a protest must do so in writing, and deliver it to the referee. The protest shall be considered as soon as possible by the referee, who shall have the power to disqualify the vehicle against whom the protest is lodged.

53. An appeal from the decision of the Referee may be made to the committee. Such appeal shall be in writing and shall be accompanied by a fee of \$25, which shall be returned if the appeal is upheld. Appeals shall not be considered if not made within twenty-four hours after the referee's decision.

57. The club shall not be responsible for the results of any civil or criminal proceedings which may be taken against any competitor. This responsibility is accepted by the competitor by the act of making entry.

Interpretation of Rules.—58. The interpretation of these rules shall rest entirely with the committee, who may alter or add to, or omit therefrom, if necessary from time to time.

Special.—60. The committee reserves the right to disqualify a contestant for what, in the opinion of the committee, is excessive speed. This rule will be rigidly enforced. A careful regard for the laws will avoid the chance of disqualification. To enforce this rule a special system of checking en route will be instituted.

WASHINGTON WILL HAVE SOME RACING.

WASHINGTON, D. C., May 21.—Within the next week articles of incorporation of the Washington Automobile Racing Association will be put on record. Only automobile dealers and salesmen in their individual capacity will be eligible to membership. The officers of the association are as follows: C. Royce Hough, president; C. W. Frank, vice-president; L. S. Jullien, treasurer; Rudolph Jose, secretary; B. C. Washington, Jr., general manager. The object of the new association is the promotion of automobile racing and hill-climbing contests, and other automobile events. The Bennings track has been secured for the first meet, in June.

BRAKE HORSEPOWER OF FOUR-CYCLE MOTORS

By GEORGE W. RICE, M.E.

FROM time to time many so-called horsepower formulæ have appeared in print; these have all been of an empirical form, or what is only a little better, based on cubic inches of piston displacement per minute, required for one horsepower.

Such formulæ may hold for any one firm building engines, if they always use about the same clearance in their different

engines, and if they always obtain the same perfection of workmanship, but the mechanical efficiency of engines of different makes will vary and the different compression pressures due to the use of widely varying clearance volume will change the indicated horsepower.

Therefore it seems that a rational brake horsepower formula cannot be based on

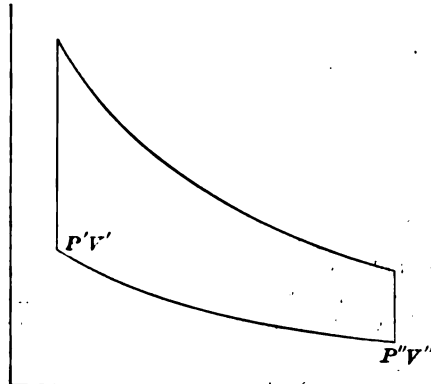


FIG. 1.—BRAKE H.P. BY GEORGE W. RICE.

piston displacement per minute, nor on the indicated horsepower based on the theoretical indicator card with an assumed card factor.

Having complete data on about seventy engines of recent make, one way has occurred to the writer of getting around this difficulty.

Given the bore, stroke, revolutions per minute, and clearance in per cent. of the piston displacement of a given engine, and knowing that the valves are designed so as to allow that speed, we may get a formula for the brake horsepower which includes the compression pressure and the average of mechanical efficiency from modern practice.

Take a conventional gas engine card, as shown in Fig. 1, and make the assumptions that the expansion and compression curves have the same experimental equation, $pv^{\frac{1}{3}} = c$, which comes very near the truth, and that the pressure at any point on the expansion curve is c times that of the compression curve directly below. Then the work represented by the card area is equal to:

$$\frac{(p'v' - p''v'')c - (p'v' - p''v'')}{(n-1)} = (p'v' - p''v'') \frac{(c-1)}{.33}$$

$$= (p'v' - p''v'') c'$$

$$= (p'Cl) - 14.7(1 + Cl) c'$$

$$\text{But } P' = P'' \left(\frac{V''}{V'} \right)^{\frac{1}{3}} \therefore = (P' V' \left(\frac{V''}{V'} \right)^{\frac{1}{3}} - P' V'') c'$$

$$= (P' V' \left(\frac{V''}{V'} \right)^{\frac{1}{3}} - P' V'') c'$$

$$= (14.7(1 + Cl) \left(\sqrt[3]{\frac{1 + Cl}{Cl}} - 1 \right) c'$$

$$= C'(1 + Cl) \left(\sqrt[3]{\frac{1 + Cl}{Cl}} - 1 \right)$$

This last expression represents the work done per cycle, which, modified by the proper engine constants, gives us the horsepower per cylinder.

$$\text{H.P. per cylinder} = \frac{D^2 \times L \times R.P.M.}{\text{Constant}} (1 + Cl) \left(\sqrt[3]{\frac{1 + Cl}{Cl}} - 1 \right)$$

Where D = the cylinder bore.

L = length of stroke.

$R.P.M.$ = revolutions per minute.

Cl = clearance as a fraction of piston displacement.

This value for the horsepower per cylinder was plotted as abscissae and maximum brake horsepower as ordinates for a large number of engines, giving the curve shown in Fig. 2. From this curve the constant in the horsepower formula was found to be 14000.

Now the quantities in the brackets are functions of the clearance, and by plotting a curve between the function and the clearance, we get a much simpler, and equivalent expression $.48 + (1 \div 10Cl)$ = see Fig. 3. Our equation for the maximum horsepower is then a rational formula, the constant in it being based on the current practice of 1905 and 1906.

$$\text{B.H.P. per cylinder} = \frac{D^2 \times L \times R.P.M.}{14000} \times (.48 + (1 \div 10Cl)).$$

This formula is charted in Fig. 4, shown on the next page.

As an illustration of the above let us find the horsepower of an assumed engine by the formula and also by the chart, Fig. 4. Engine data: 4 1-2-inch bore, 5-inch stroke, 1,000 r. p. m., 25 clearance (in per cent. of piston displacement):

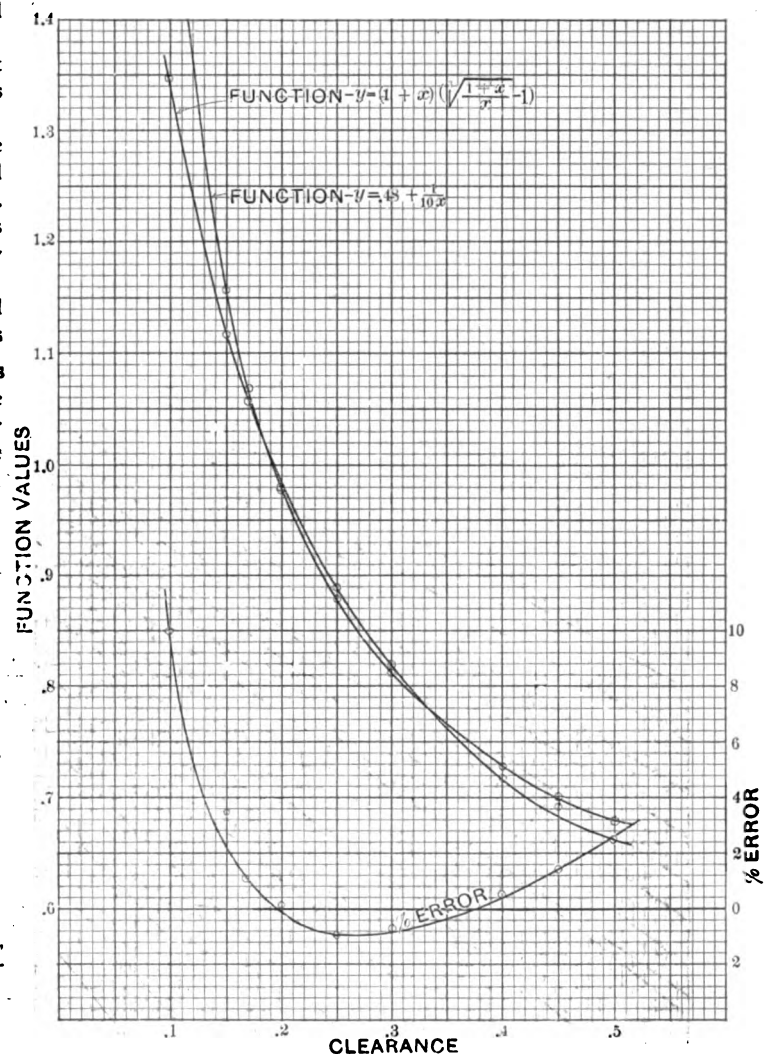


FIG. 3.—BRAKE HORSEPOWER BY GEORGE W. RICE.

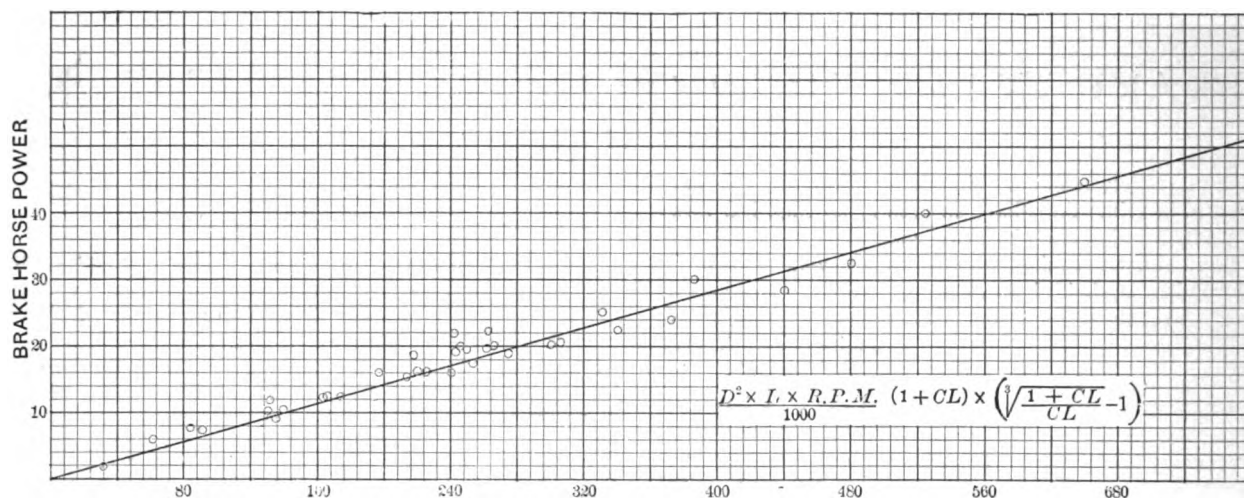


FIG. 2.—BRAKE HORSEPOWER BY GEORGE W. RICE.

$$\begin{aligned} \text{B. H. P.} &= \frac{D^2 \times L \times R.P.M.}{14000} (.48 + 1.10CL) \\ &= \frac{20.25 \times 5 \times 1000}{14000} (.48 + .4) \\ &= 6.365, \text{ result by formula.} \end{aligned}$$

While with the chart the solution is as follows: Starting at the top of the chart with 4 1/2-inch cylinder diameter, move down until you intersect with the diagonal line marked 1000,

then move horizontally until you intersect with the diagonal line marked .25, from there vertically to the diagonal line marked 5, and from there horizontally to the vertical "Maximum Brake Horse Power" scale, where the result 6.3 may be read off. This solution is indicated on the chart by the heavy line carrying the arrows. In case it was desired to modify this formula so as to fit any one particular builder's make of engine, the factor 14000 would be the one to change.

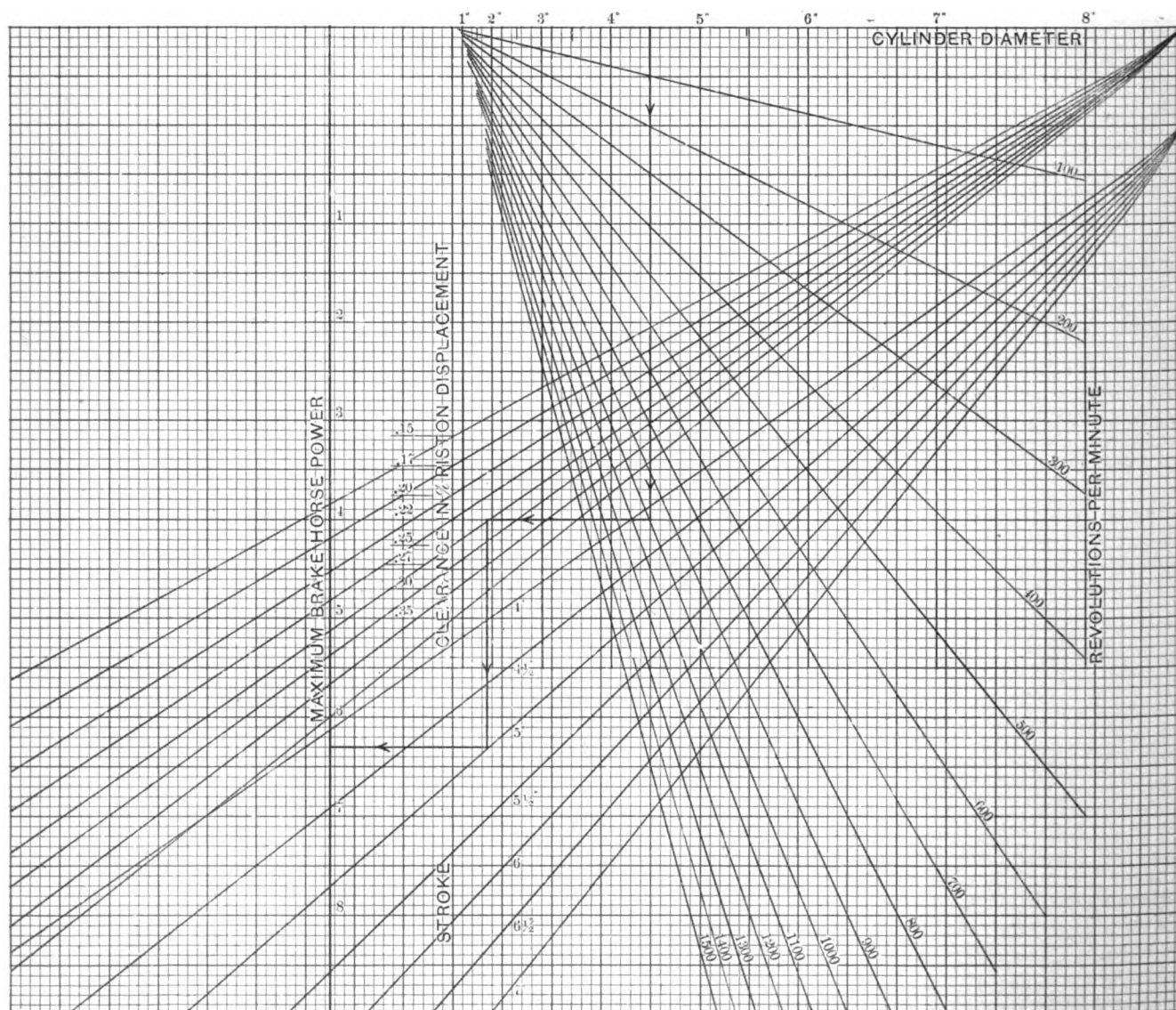


FIG. 1.—BRAKE HORSEPOWER BY GEORGE W. RICE.

DESIGN AND CONSTRUCTION OF AUTO BOATS*

By JAMES A. SMITH.

ALTHOUGH the high-speed motor boat has claimed a considerable amount of attention the last two years, it is of very recent introduction, if we except the high-speed steam launches and the early torpedo boats of twenty to thirty years ago. This paper concerns itself mainly with the modern types of high-speed launches which have been rendered possible by the developments in internal-combustion motors since the present century opened.

It is, of course, well known that such firms as Messrs. Thornycroft were building in the seventies and eighties powerful steam launches having a form of hull which has served as a basis on which the designers of modern motor launches have worked, but it was not until within the last three years that it became possible to install motors of 100, 200, and even 300 actual horsepower in boats having a total displacement of less than two tons. Except for the fast steam launches referred to, there was no gradual development of the modern motor boat during a long period of years, as has been usual in most other branches of engineering, so that designers have been, as it were, suddenly confronted with the problem of producing safe and seaworthy designs for very high powers, with practically no data upon which to work. The large number of fast launches now in existence which fulfill these conditions is a proof that the problem has been attacked and solved in a satisfactory manner, so that even at this early date it is interesting to recall the fears with which hull designers were beset so recently as three years ago. It was then felt that a 2-foot propeller revolving at the rate of seventeen to twenty revolutions per second would have a tendency to upset a very light and narrow hull, also that such hulls would inevitably drown themselves in anything of a seaway, or that they would be dangerous and unmanageable under the helm, and, in brief, that they were so far in advance of shipbuilding practice that they represented an impracticable problem. Such fears have proved to be without foundation.

The first serious attempt to produce a high-speed motor launch in Great Britain was made by S. F. Edge in 1902. This highly successful boat was designed by Linton Hope, and represented an important advance on anything previously attempted, a speed of 19 knots being attained in fairly smooth water, with 66 rated motor power. At the same time a large development in high-speed motor launches took place in France, although no boats of any note were produced there until 1903, when Thubron's

Trèfle-à-Quatre was built; she was 33 feet long, and had a motor of 85 horsepower. These two boats proved what could be done, and since then the development has been very great.

Rules Affecting Design of Auto Boats.

No sooner had the practicability of the marine motor been proved than it was recognized as a suitable propelling agency for light river launches, yachts' tenders, ferryboats, speed-cruising boats, and boats for various other pleasure and commercial purposes. A new and interesting sport had been introduced, and many people had such launches built almost entirely for racing purposes. In 1902 it was felt that the sport should be properly governed, and the governing body in Great Britain, the Marine Motor Association, was founded in that year. In the United States, where the natural facilities for the use of motor boats are many times greater than in Great Britain, the governing body, the American Power Boat Association, was formed at the same time. In France in the same year the Automobile Club de France undertook the management of the sport, as did also the Yacht Club de France, while in Germany in the following year the Deutscher Automobil Club provided suitable legislation.

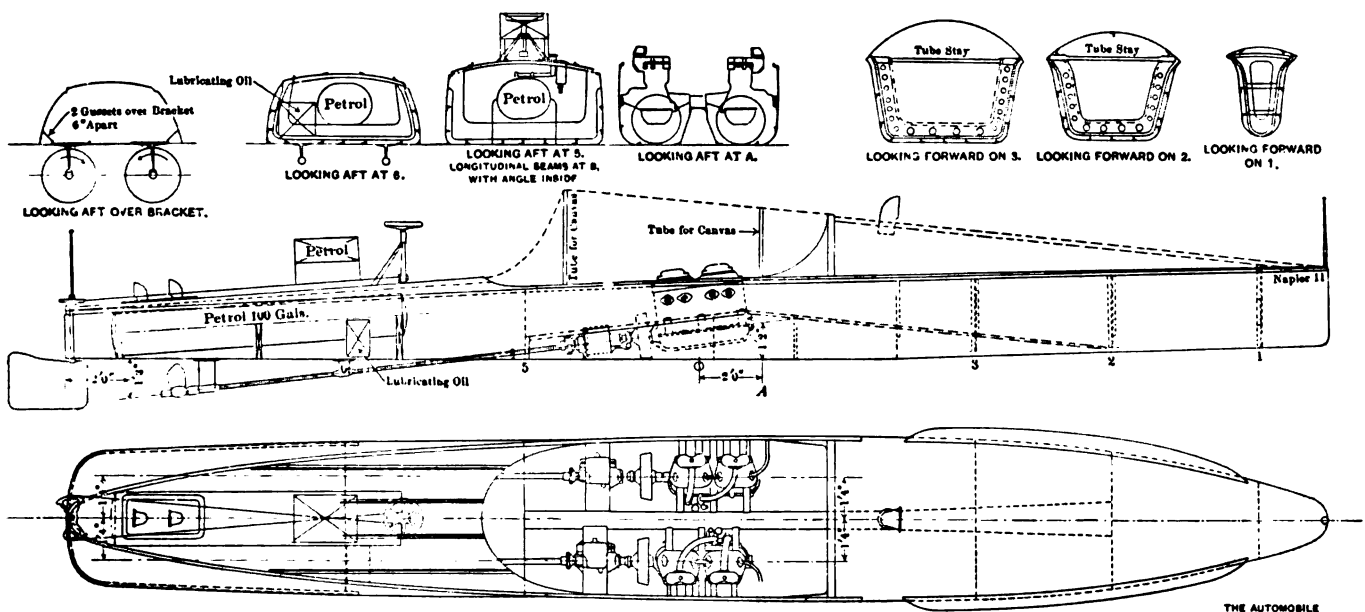
The various racing rules are outside the scope of this paper, but we may consider some of the rules which have had a bearing on the design and construction of the boats themselves. The boats naturally fell at once into two classes:

(1) Racers, upon the design of which none of the governing bodies has imposed any other restriction than that of length.

(2) Restricted Classes, for which rules have been provided governing beam, freeboard, life-saving appliances, and latterly horsepower.

The length of the high-powered racing classes has been practically fixed at 40 feet, or 12 meters in the case of French boats, this length being limited by European railway facilities, such boats being usually taken by rail from one place to another for racing purposes. The beam and freeboard of these boats have naturally been reduced as much as possible, but it has been found that for powers over 100 horsepower a minimum beam of about 5 feet, or 8 beams in the length, is necessary to provide sufficient stability under helm, and to give sufficiency of bearing aft. With the object of saving weight, many of the racing boats have had

*From a paper read before the Institute of Naval Architects in London.



PLANS OF THE AUTO BOAT NAPIER II., BUILT BY YARROW AND EQUIPPED WITH NAPIER ENGINES.

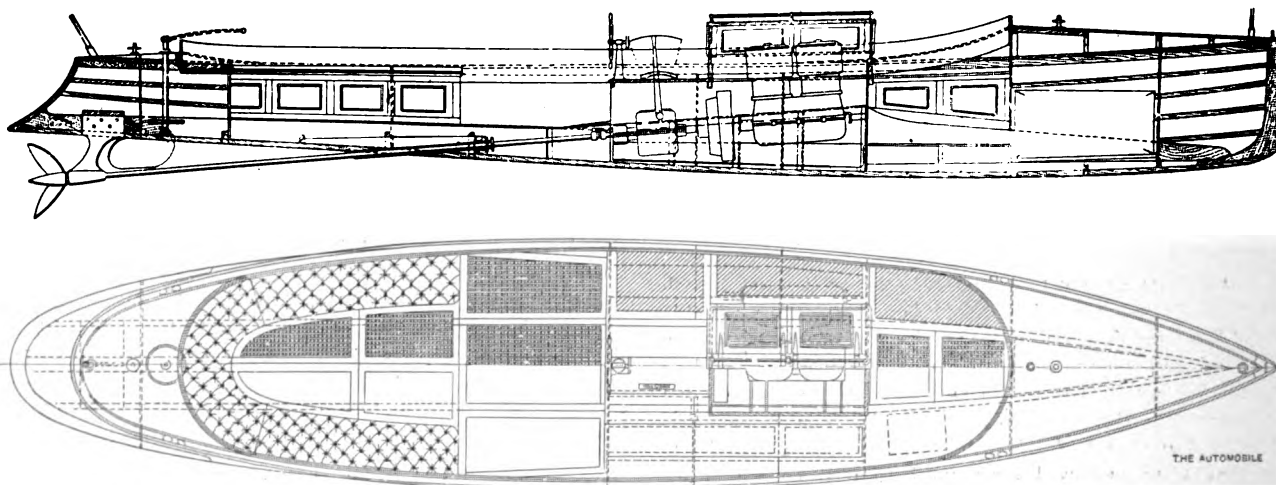
their freeboard reduced to an unwise extent, but the small advantage in displacement gained thereby does not at all compensate for the discomfort and danger entailed.

In the beginning the Marine Motor Association assumed that the restricted classes should be specially legislated for, so as to encourage healthy and safe types of boats, and it was rightly thought that the kind of boat required for the many duties of a yacht's launch or tender was the type which ought to be developed. Their restricted classes were therefore described as "yachts' launches," and a maximum beam-length ratio was fixed, varying from 3.4 for the smallest classes to 5.2 for boats 30 feet in length, the minimum freeboard being fixed at 25 per cent. of the minimum beam. Within these limits safe and comfortable boats can be designed, which may be depended upon to possess sufficient stability and reserve of buoyancy even in a heavy sea-way. With the object of putting a premium on displacement, and indirectly on scantlings, the association devised a rating rule in which the area of greatest immersed cross section is a divisor, the rule at present being:

$$\frac{(\text{Motor Power})^2}{\text{Area of immersed midship section in square feet}} + \sqrt{\text{Length overall in feet}} = \text{Rating for time allowance,}$$

so that boats of heavy build gain a considerable advantage when racing under time allowance. It will also be observed that high powers are not favored in the restricted classes. More recent legislation restricts the power of these boats to 3.5 horsepower per ton (Thames measurement).

from the ordinary types then in use. Although the electric launch came greatly into favor, during the last decade, the weight of machinery per horsepower was comparatively so high that special forms of hull were not found to be necessary, so that the majority of these boats are found to be of what we may call the ordinary ship form, with long straight keels, and either a transom or canoe stern or long counter. Soon after the introduction, however, of the internal combustion motor the speed-length ratio rose very rapidly, and a short experience was sufficient to prove that the ordinary ship form was unsuitable. The difference between the water pressures on the fore- and after-bodies caused such launches to trim so much by the stern when under way that they were not only uncomfortable but dangerous, consequently the plan was adopted of cutting away all the deadwood aft, and leaving the run of a practically flat section. In many cases this flattening and widening of the after-body sections have been carried to extremes, probably as the result of some confusion between the causes and effects of high speeds. This form of after-body is common to nearly all high-speed motor launches, and for such vessels it has proved to be satisfactory for sea work, providing as it does a large amount of surface and initial stability, and tending to counteract the "throw-over" of the screw in a narrow beam boat of high power. It has also been found that a boat of this form, in the case of a break-down of machinery, behaves well in the trough of a sea, keeping practically normal to the wave-surface owing to its flat form and light displacement, and that



PLANS OF THE QUICKSILVER, A 30-FOOT AUTO BOAT OF THE FAST CRUISER CLASS.

The following are particulars of two representative boats built to this rule, before the power restriction came into force, and it is also to be noted that both these boats are within the limits of the French restrictions:

	Takumono.	Quicksilver.
Length overall	21 ft. 4 in.	30 ft. 0 in.
Breadth over planking	4 ft. 10 in.	5 ft. 10 in.
Draft amidships	11 in.	11 in.
Draft extreme at propeller	1 ft. 8 in.	2 ft. 0 in.
Motor power by M.M.A. Rule	12.6	39
Weight of hull department complete	800 lbs.	1,500 lbs.
Weight of machinery department complete, tank full	590 lbs.	1,300 lbs.
Area of midship section	2.72 sq. ft.	3.06 sq. ft.
Speed, light, with crew only	12.8 knots	18.2 knots
Revolutions	1,000	900
Load at Rule freeboard, dead-weight	830 lbs.	600 lbs.
Load displacement	0.99 tons	1.52 tons

The rules adopted by the various foreign governing bodies for restricted or "cruising" boats have been designed with the same objects in view, and there are now many hundreds of such boats in actual use, the number also increasing at a rate which shows no diminution.

Various Considerations in Design and Construction.

Reverting to the early types of motor boats, it will be seen that they do not differ in form in any marked degree

it ships very little water, provided it is left to find its own conditions.

The amount of flat bearing surface required to prevent excessive change of trim need not be considered until the ratio of speed to $\sqrt{\text{length}}$ exceeds unity. The ratio in high-speed motor launches is usually in the vicinity of 3, sometimes exceeding 4, and here a minimum bearing surface of about 40 per cent. of the area of the load-water plane should be provided. Generally speaking, the form of this bearing surface is of more importance than its extent, as boats which have been designed for one power have afterwards had their motors replaced by others more than twice as powerful without showing excessive change of trim under way. Other forms of run have been tried, varying between a V section and a tunneled section, but the former, unless carefully wrought out, tends to produce a boat which will heel considerably when the helm is put over, while the latter, although it permits the shaft to be fitted with less rake, is apt to interfere seriously with the free run of the stream lines.

Many forms of midship section have been tried, including sections of an almost triangular shape, flat sections with slightly rounded bilges, and sections of an elliptical form. As the midship section affects the form of the lines in a great

part of both bodies, and as the skin friction must be reduced as much as possible, a section should be made approximating to that giving the least wetted surface, and the form now generally adopted is that of an ellipse V-d slightly towards the keel. This form lends itself to a good type both of after-body and fore-body, permits of an easy angle of entrance of the water lines, and of a suitable form of sectional area curve. Perhaps the best example of this form of midship section is that of *Trèfle-à-Quatre*. As to the fore-body, some designers have recommended that it should be made up of sharp V sections, forming with the after-body the double wedge or "all entrance and all run" form of lines. This form is good in theory, but does not work well in practice, as a short high-powered boat built strictly on these lines would bury itself too much when among waves, and it is also difficult to see what would be lost by cutting off the whole of the deep fore-foot, thereby lessening the wetted surface, and avoiding panting and vibration forward; when this is done the theoretical double wedge no longer exists.

Shallow U-shaped sections forward have been frequently used, giving good results in the matter of speed, but they tend to break the water into fine spray a short distance from the stem, which, coming inboard, renders the boat uncomfortable. A suitable form of fore-body is produced by the adoption of a compromise between the very sharp V section and the U section.

The form of sectional area curve is not of great moment in ordinary well-designed boats; for those who prefer it a curve of versed sines and trochoids will give as good results as any other.

The shape of the boat above the water line is largely a matter of individual taste, and with the light scantlings usually employed, it is possible to form the upper body, and particularly the stern, into almost any desired form.

Other forms of under-water body have been tried, including straight-line boats with perfectly flat bottoms, which are easy to build, but possess no other advantages. In *Napier II.*, designed and built by Yarrow, a new form of hull has been adopted consisting of an after-body of usual form, a flat midship section with slightly rounded bilges, and an inclined plane forward from about a third of the length from the stem, meeting the water line at the stem; the object being to cause the fore part of the boat to lift out of the water, and thereby lessen the skin and wave resistances. Very satisfactory speed results have been obtained from this boat, and a second boat of similar design, *Yarrow-Napier*, has been built. Although it is difficult, from a mechanical standpoint, to estimate the advantages to be gained by the adoption of this form, there appears to be little doubt that the "skating" effect has been achieved.

The particulars of *Napier II.* are as follows:

Length overall	40 ft. 0 in.
Beam extreme	5 ft. 0 in.
Draft amidships	9 in.
Weight of hull department complete	3,300 lbs.
Weight of machinery department complete, tank full ..	3,400 lbs.
Total displacement with crew of three	3.19 tons.
Motor power by M. M. A. Rule	146

Following on the experience gained with *Napier II.*, Messrs. Yarrow have just completed a 60-foot second-class torpedo boat, "1176," built of steel, and fitted with five 75-horsepower Yarrow-Napier motors. A form of underwater body similar to that of *Napier II.* and *Yarrow-Napier* has been adopted. The boat travels very lightly over the water, with, judging from the waves and wake, very little wave resistance. Comparing this boat with a second-class steam torpedo boat, the weights and speeds are:

2nd Class Steam Torpedo Boat.			
Displacement	11 tons	"1176."	
Weight of machinery department, steam up	5.25 tons		8 tons.
I.H.P.	300		3 tons.
Average speed, smooth water	20 knots		25 knots

The sheer draft of *Napier*, a 12-meter launch built by Saunders last year, illustrates a type of underwater body designed on exactly opposite lines to the Yarrow boats. The fore-body consists of V sections, passing into a midship sec-

tion with a hollow bilge, the hollow increasing aft of midships until at about one-fourth of the length from the stern the vertical underwater body disappears, leaving flat sections aft of this of the usual motor boat form. The after part of the vertical body, therefore, appears not unlike one of the built-out shaft bosses of a twin-screw steamer. Very fine entrance lines are obtained; and, although the boat has more wetted surface than one of usual form, she has very little wave-making resistance. Constructional advantages are also gained, the long motor-bearers being dispensed with, while the shaft may be fitted almost horizontally.

Methods of Construction and Materials Used.

Some of the earlier motor boats, including *Napier I.* and *Napier II.*, were built of steel, but it has been found that steel is an unsuitable material for light high-powered boats under 50 feet in length. The chief disadvantages are, first, the difficulty of obtaining a fair surface, which is of great importance in this type of boat, and secondly, the difficulty of making satisfactory joints in the thin material which has to be employed. Considerations of weight and expense tend also largely in favor of wood in the construction of such boats. The weight of hull of *Napier II.* was 1.47 tons for 140 horsepower, but a similar hull of a suitable wood construction need not have weighed more than 1,120 pounds complete. For such light boats wood has many advantages.

The systems of wood construction commonly adopted are: (1) Ordinary carvel planking with cut or bent timbers. (2) Double skin without timbers for small boats, and with timbers for larger boats or for higher powers. (3) Treble skin with or without timbers. The first method (planks and timbers) is safe to employ where weights need not be greatly cut down, and it is also the cheapest. The second system (double skin) is that most commonly employed for high-powered boats, and gives satisfactory results in every way. For light, fast launches up to 25 feet in length timbers need not be used, and in boats of greater length, or with higher powers, bent timbering may be introduced with advantage. The construction plan of *C. G. V.*, a racing launch of 130 horsepower, shows an example of this method of building, the details being:

Length overall	11.99 meters (39 ft. 4 in.)
Breadth extreme over planking	5 ft.
Depth amidships to coaming	3 ft. 6 in.
Draft amidships	8 in.
Draft extreme at propeller	2 ft. 3 in.
Displacement, total	1.7 tons.
Weight of hull department complete	750 lbs.
Weight of machinery department complete, tank full ..	2,700 lbs.
Load at designed water-line	350 lbs.

The third system (treble skin) is more expensive, without corresponding advantages. Other systems have been introduced, including the "ribband carvel" system, consisting generally of a light single carvel skin with very light timbers, and having the edges fastened by means of edge strips inside, scored over the timbers. This system gives a somewhat lighter hull than No. 2, but is much more expensive, and necessitates highly skilled workmanship. Saunders' sewn system is also largely adopted for speed launches; by this method two, three, four, and occasionally five skins of very light veneer are sewn together with copper wire, producing a form of skin which is exceedingly strong, and which may also be built to forms which are almost impossible by any other system, each skin being laid on separately, and the whole afterward sewn together.

It will be noticed that in most of the high-powered launches the requisite longitudinal strength is chiefly obtained by extending the solid wood girders carrying the machinery over a great part, or the whole, of the length of the boat. An extension of this idea has been recently devised, according to which the skin or shell of the vessel is not required to contribute directly to the structural strength, the engine girders being constructed to form, in conjunction with one or more other members and suitable transverse framing, a complete framework in themselves.

THE AUTOMOBILE ROUTE INTO NEW HAVEN.

Editor of THE AUTOMOBILE:

[332].—Several news notes have appeared in the newspapers recently, announcing the opening of the new Kimberly avenue bridge over the West River between West Haven and New Haven, Conn. This is of interest to automobile tourists, since it restores the route in and out of New Haven as the A. C. A. and A. A. A. cards have had it practically from the beginning. But as this bridge has been entirely out of commission for at least two years, there has no doubt been a lot of trouble for locally unacquainted tourists using these cards, since the connection into New Haven that way has been absolutely closed.

The preferable entrance into New Haven from this direction was very carefully considered at the time of shaping the New York-New Haven routes for the Automobile Special A. A. A. Blue Book, especially as the bridge just completed had been expected to open the early part of the summer. Some personal experience and the best advice, however, led the compiler of the Blue Book to give first place to the route universally used during the long reconstruction of this bridge, and to give the old route the subordinate form for the convenience of any who might have reason to go that way.

In the first place the old route was made up of portions of the Shore Road, Second avenue, Monahan street, First avenue, Elm street, Kimberly avenue (from which the new bridge is named) and Congress street to Church street, then up Church street to Chapel street, the principal four corners of the city. This route is now restored to its former practicability, but no one who has been over it would recall the way as easy to find or follow—particularly this side of the bridge. On the other hand the "New" route, which turns left from the Shore Road on Savin avenue to "West Haven Green," thence through Campbell avenue and Davenport avenue, is good running throughout and much easier to follow, either from a printed schedule or from verbal directions.

It is not expected, therefore, that the Kimberly avenue bridge will again become the factor in road travel that was formerly the case. On the other hand, it will take care of most of the trolleys and heavy traffic; even if a trifle shorter (not much shorter in any event), the other route will be quicker and easier for automobiles. Another thing: Entering by Davenport avenue one is well placed for a continuance of the run across Yale "Common" (for Meriden and Hartford) without going through the crowded trolley and traffic center at Church and Chapel streets.

And should one's turning point for the through run be that part of the city north and west of the "Common," one may turn left through Orchard or any other convenient street without going downtown at all. There is at least one prominent garage in that section, where the routes to (1) Derby, Ansonia and Waterbury, and (2) Mt. Carmel, Cheshire and Waterbury diverge, as well as routes to various local points. These considerations further influenced the Blue Book to give second place to the old-time entrance over the Kimberly avenue bridge; and the writer believes that the A. C. A. route cards could, with advantage, be changed in the same manner.

Clinton, Oneida County, N. Y.

ROBERT BRUCE.

TO FIND POSITIVE AND NEGATIVE POLES.

Editor THE AUTOMOBILE:

[333].—Can you please inform me how to find the positive and negative poles for charging storage batteries from a dynamo or light installation. My house is lighted from the city with 16 candlepower lamps at 110 volts. Should I require a special switch-board, or could I charge from a lamp socket? In the shop we have a dynamo of 110 volts at 2,000 revolutions; the engineer told me it was a direct current, yet I read a book which said all dynamos produced alternating currents. Also, he said the more resistance you put in, the more power is transmitted to the driven articles; that is, if you have 20 lamps burning and you want 30 lamps on, you put more resistance in.

H. T. S.

Salt Lake City.

To test the positive and negative poles of any direct current circuit, immerse the terminals in a bath of slightly acidulated or salted water. The current will flow through the water causing bubbles of oxygen to rise from the positive pole and bubbles of hydrogen to rise from the negative pole. There are about twice as many of hydrogen as there are of oxygen bubbles formed, hence the terminal from which the greater number of bubbles rises is the negative pole.

Decreasing the resistance of the external circuit, the voltage remaining constant, causes more current to flow and since the energy in an electric circuit is the product of the voltage multiplied by the current (amperes), 30 lamps will require one-half again as much energy as 20 lamps require. All dynamos generate, primarily, an alternating current, but by the interposition of a commutator in the direct current machine the current is practically switched and caused to flow in one direction. An ignition battery may be charged by connecting it in series with a 32 candlepower lamp in an ordinary 110 volt lighting circuit.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

May 24-26—Open Air Show, Empire City Track, New York Trade Association.

Tours.

May 30...—Endurance Run, Salt Lake City to Ogden, Utah. Bert Fuller, Manager, Salt Lake City.

June 6...—Orphans' Day, Second Annual Celebration by the New York Motor Club.

June 16-18—Three-Day Tour, Bay State Automobile Association, Boston to Rye Beach, N. H.

June 18-23—Second Annual Economy Test, New York Motor Club.

June 21-26—Second Annual Tour, Albany Automobile Club, Albany to Boston and Return.

June 23...—Rochester, N. Y., Automobile Floral Parade at Genesee Valley Park. Rochester Automobile Club.

July 12...—Annual A. A. A. Tour, Chicago to Bretton Woods, N. H. Rules for the Glidden Trophy operative from Buffalo.

Race Meets and Hill Climbs.

May 30...—Boston Annual Meet of the Bay State Automobile Association, Readville Track.

May 30...—Gates' Mills Hill Climb. Cleveland (O.) Automobile Club.

May 30...—Baltimore (Md.) Race Meet, Maryland Motor Exhibition Association.

June 9...—Hohokus, N. J., Second Annual Race Meet of the North Jersey Automobile Club. (Robert Beattie, secretary, Little Falls, N. J.).

Sept. 3...—100-Mile Road Race, on 25-Mile Circuit in Monroe County, N. Y. Rochester Automobile Club and New York State Automobile Association.

Sept. 22...—American Elimination Trials for Vanderbilt Cup Race (Long Island Course probable).

Sept.—Colorado Springs. Two-Day Meet. Centennial Celebration Discovery of Pike's Peak.

Oct. 6...—Vanderbilt Cup Race, American Automobile Association.

Motorcycle Tours and Contests.

May 30...—Fort George Hill Climb, New York Motorcycle Club.

May 30...—Race Meet, Chicago Motorcycle Club, Washington Park Track.

July 3-7...—Annual Endurance Run and Meet, Federation American Motorcyclists, Rochester, N. Y.

July 4...—Tour to Rochester, N. Y., New York Motorcycle Club.

FOREIGN.

Shows.

Oct. 5-14—Leipzig (Germany) Exhibition, Krystall Palast.

Nov. 1...—New Zealand International Exhibition opens at Christchurch.

Nov. 1-16—Berlin (Germany) Automobile Exhibition.

Nov. 15-24—London, Olympia Motor Show.

Nov. 23-Dec. 1—London, Stanley Show, Agricultural Hall.

Tours.

June 5-13—Herkomer Cup Touring and Speed Trials, Munich, Bavaria.

June 11-16—Land's End to John O'Groats. Auto Cycle Club of Great Britain.

June 13-16—Scottish Reliability Trials.

July 26-Aug. 15—Circuit Européen, 3,000 miles, Paris, Milan, Vienna, Berlin, Cologne, Paris.

Races, Etc.

May 27...—Motor Cycle Club of France, Championships.

June 26-27—Le Grand Prix, Sarthe Circuit, France.

July 8...—International Cup Race for Motorcycles, Cesky Club Motorcyclistu of Austria.

July 15...—Suze-Mont Cenis Hill Climb (Italy). Automobile Club of Turin.

Aug. 1-15—Circuit des Ardennes (Belgium).

Aug. 9-12—Malchamps (France) Hill Climb Tests.

Aug. 15-16—Ventoux (France) Automobile Meeting.

Aug. 14-19—Ostend (Belgium) Meet.

Aug. 18...—Liedekerke Cup Race.

Aug. 23...—Semmering Hill Climb.

Aug. 27-Sept. 2—Brescia (Italy) Automobile Meeting.

Sept. 27...—Tourist Trophy Race, Isle of Man, A. C. of Great Britain.

Oct. 7...—Chateau Thierry (France) Hill Climb.

Oct. 28...—Gallion (France) Hill Climb.

ONE HUNDRED MILES IN SOUTHWEST INDIANA

By CLARENCE L. CUMMINS.

INDIANA'S ninety-two counties contain something like 75,000 miles of roads, and that the most of them are good is due to the crusade, first started by the army of bicycle riders of a few years ago, continued by the awakened farmers, and now carried on by the 3,000 owners of automobiles in the state. Indiana has few elevations of note, and the most of the hills tended to mar the pleasure of the automobile driver are located in the southern part of the state, little traversed by automobiles. In the southern part of the state, too, there is found a trace now and then of the ancient toll system, which is frequently doubled for the automobile driver, and overlooked for the man with the horse and wagon.

Naturally, with such a predominance of good roads, Indiana affords an unusual number of routes for automobile tours. Broad, well-kept roads, with scenery unsurpassed by any Western state, may be found in any direction from Indianapolis, and whether the route be 20, 50 or 100 miles long, there is generally the same pleasant monotony of good roads and beautiful scenery. But the old routes often grow tiresome and some of the more venturesome drivers seek new tours through Hoosierdom. A route that will afford all sorts of roads and conditions—good roads, bad roads, level stretches and hills that will test the hill-climbing ability of the automobile—are sought. There is hardly a day but what some of the 600 drivers of Indianapolis are out seeking new routes or finding methods of improving old ones. Such a route has just been "discovered," and it promises to develop into the most popular diverging from Indianapolis. It is 100 miles long, the average run for a day of an Indiana driver, and offers a diversity that should please the most exacting. The scenery is beautiful along the whole route, and the roads are of almost every kind of construction known to Hoosier road-makers, past and present.

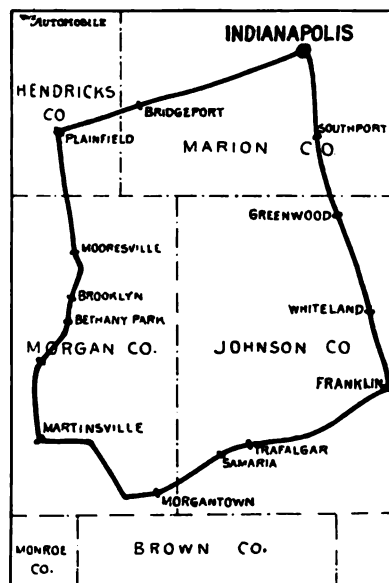
Leaving Indianapolis, the route lies westward, going in that direction on Washington street, which becomes the national road after leaving the city limits. The first fourteen miles of the run lie along the national road, paralleling the Pennsylvania Rail-

road and the Indiana Coal Traction Line through Bridgeport to Plainfield. The latter is a quaint old Quaker town, evidences of which are plainly delineated in each step through the little town, where is also located the Indiana Boys' School, a reform institution.

Out of Plainfield the Mooresville pike is followed a distance of seven miles, the first bit of pretty scenery along the route being encountered at Black Rock schoolhouse, located upon a hill, with the quiet, flowing White Lick half slumbering at its feet. Through Mooresville, a beautiful little town that is taking on metropolitan airs, and is surrounded by green-clad hills and dales, the run extends one mile south to Moon's Hill, the first real test of hill climbing. From the top of the hill the trip follows the Indianapolis and Vincennes railroad about five miles into Brooklyn, a sleepy village with quaint homes, and made famous by "Jap" Miller, known throughout the country by reason of the poem by James Whitcomb Riley, in which he is the subject.

The run from Brooklyn to Bethany Park, one of the best known summer resorts in Indiana, is accompanied by delightful scenery, and the air is laden with the perfume of the flowers that line the woodlands and hills. Another short run and the road reaches Blue Clay Hill, ascending which is a difficult task because of about eight inches of blue clay, kept unpleasantly moistened through the summer season, because of the small springs at the summit. South and west the course angles through Centerton to Blue Bluffs, and the remainder of the morning run is due south to Martinsville, the county seat of Morgan County. Martinsville is a health resort, and an excellent place to stop for dinner on the run. There are any number of healthful mineral springs, and there are several modern sanitariums and hotels, at the majority of which moderate prices prevail. The morning run is thirty-five miles, all along good gravel roads.

The most enjoyable portion of the trip comes after leaving Martinsville, good roads prevailing throughout the remainder of the trip, and fewer hills being encountered. Leaving Mar-



ON MOORESVILLE PIKE, SOUTH OF PLAINFIELD.



SALT CREEK, NORTHERN EDGE OF BROWN COUNTY.

tinsville, the route lies in a southeastern direction to Morgantown, going due east for one mile out of Martinsville, and taking the road between the High Hollow schoolhouse and church, which are opposite each other. The distance to Morgantown is eleven miles, and there is a touch of hill climbing before reaching that town that adds considerable zest to the trip. Among the largest hills are the Rock and Nebo Hill and Ridge. The scenery is more wild and picturesque than could be imagined existed in Indiana. Nebo Hill is nearly two miles long and easy to mount, from the summit the course lying around a ridge a distance of two miles.

For half an hour one can imagine one's self in the wildest regions of the mountains of backwoods Kentucky or Virginia. Log cabins built forty and fifty years ago, and still serving as the habitations of the farmers, are found in numbers. The land for the most part is poor, but the roads are good, and the air encountered is invigorating. The most typical of the log cabins found is that of Hiram Skeggs, who, with his family of ten children, lives in four small rooms. From this elevation, 800 feet above the sea level, and one of the highest elevations in Indiana, one can see Brown and Johnson counties, the former the least settled county in Indiana and containing but one railroad.



HIRAM SKEGGS' CABIN ON NEBO HILL SUMMIT.

Like the mountaineers of Kentucky and Virginia, too, the farmers of this picturesque section of Indiana are hospitable. They are the friends of automobile drivers, and if their humble homes contain anything that the driver may wish, it is his for the asking. There was a time when the farmers of this part of Hoosierdom looked with displeasure upon the motor vehicle, but that time has passed.

Farther along the tourist encounters two miles of dirt road, leading into Morgantown from the west. Here directions can be obtained as to the best routes toward Franklin, through Samaria and Trafalgar, sixteen miles. Before leaving Morgantown a side trip to Brown County can be made, into which few automobiles have ever been. The Brown County boundary is only two miles south from Morgantown, and if one desires one can have the pleasure of a one-mile coast into a small stream, passing through three counties.

From Morgantown to Franklin the course is northeast, crossing the Indianapolis Southern railroad at the edge of Morgantown, running four miles due east, and two north to Samaria, followed by two miles northeast through Trafalgar. The road from Trafalgar to Franklin contains a number of small hills, all of which can be mounted without a change of gear.

Like stepping from darkness into light is the run from Franklin to Indianapolis, for from the least settled portion of Indiana, in half an hour's time, one encounters one of the most up-to-date portions of the state. The twenty miles between Franklin and Indianapolis lie along the Madison road, a veritable speedway

and passing through Whiteland, Greenwood and Southport, entering Indianapolis at the end of South Meridian street. At Greenwood will be found one of the largest tomato canning factories in the country, while near Southport there is a pleasant little park, where one may stop to rest for a few minutes if desired. The whole route is practically new and not more than half a dozen automobiles have gone over it in its entirety. Those who have gone over it say it is one of the most pleasant day's runs in all of Indiana, and it is sure to prove popular during the summer.

RECOMMENDS EXAMINATIONS BE REQUIRED.

INDIANAPOLIS, IND., May 21.—An event in Indiana automobile circles occurred last week, when the Chauffeurs' and Repairers' Association of Indiana was organized with fifteen charter members. The membership is limited to chauffeurs and repairmen living in Indiana. William Davidson was elected president; William Rugenstein, vice-president; Fred Wiltshire, secretary, and George Swinehart, treasurer. The Board of Directors is composed of Harry Bell, Minor Farley, Gus Krause and Jesse Sutherland.

The organization, among other things, will seek to have a law passed by the Indiana Legislature requiring that chauffeurs and repairers be examined and registered. Members are required to be more than eighteen years old, and must undergo a strict examination before being admitted to membership.

There will also be an effort made to regulate wages of chauffeurs and repairmen, both in the employ of individuals and garages. At present chauffeurs are paid according to the purse of the employer, and not according to ability. Wages on an average are about \$15 a week, while one man in Indianapolis gets \$100 a month and another \$125 a month. There will be a minimum wage scale, which will not, of course, interfere with an employer paying as high an amount as he may desire.

SCORE ONE FOR THE AUTOMOBILE.

INDIANAPOLIS, IND., May 21.—The carefulness and efficiency of Indiana automobile drivers is shown by a report issued today by Dr. J. N. Hurty, secretary of the State Board of Health, showing that during the month of April not one death resulted from the automobile in the state. On the other hand, three deaths were due to horses, seventeen persons were killed by trains and two by trolley cars during the month. Not one serious accident due to an automobile occurred in the state during the thirty days covered by the report. The excellent showing made is held as a strong point in favor of the automobile, and on every hand police officials have words of commendation for automobile drivers. While there was some complaint of the speed limits fixed by the Indiana automobile law, since it went into effect there has been little inclination to violate its provisions.

CANADA'S RAPIDLY INCREASING TRADE.

According to consular reports there were imported into Canada 408 automobiles during 1905, valued at \$489,000, the previous year's imports having been 362 cars, valued at \$317,000. Last year the three concerns operating manufactured and marketed in Canada probably 200 cars. It is estimated that there are now in the Dominion about 1,500 cars. The demand is on the increase, and it is predicted that not only will the importations this year increase, but the home production will probably be 500. A new factory has been established at Chatham, Ont.

An English automobilist, on entering Russia with his car, was arrested and detained for three days, until the police satisfied themselves that the small tire vulcanizer that he carried was not an infernal machine.

FOR AMERICAN AUTOISTS WHO TOUR ABROAD

By U. S. CONSUL-GENERAL FRANK H. MASON, PARIS.

AN automobile vehicle imported into France, for whatever purpose, is subject to a specific duty, which varies according to the nature of the motor, whether steam, electric, or hydro-carbon, and also whether the country from which it comes is or is not entitled by treaty to the minimum tariff on imports into this country. America, unfortunately, has no such treaty, and therefore motor vehicles originally made in the United States are subject to the general or maximum tariff rate, viz.: Automobiles, for persons, weighing 275 pounds or more, \$11.58 per 220 pounds; motor bicycles, etc., weighing less than 275 pounds, \$28.95 per 220 pounds. Electric automobiles are taxed as above on the vehicle and motor, and \$4.14 per 220 pounds on the accumulators which they carry. When imported for touring or other temporary purpose, the duty so paid on a motor vehicle will be refunded at the frontier when the vehicle leaves France on presentation of the receipt given by the customs officer at the port of entry.

Nature and Uses of the "Triptyque."

As a means of avoiding the payment of this deposit at the frontier, many Americans and other foreigners avail themselves of the special privileges of the Touring Club de France, a powerful organization founded in 1890, which has now nearly 100,000 members, and central headquarters at No. 65, Avenue de la Grande Armée, Paris. A foreign member of the club, wishing to make a tour with his automobile in France, may obtain from its central office a permit for the temporary importation of his machine. The application for this permission is made on a prescribed form, accompanied by a deposit of the amount of duty, and the permit is at once issued under its authority, the club becoming, so to speak, responsible for its member during his sojourn in France. This license for free international circulation is known as "Le Triptyque," being printed on three leaves or sections, each bearing the same serial number. The first leaf is detached for the customs officials at the port of entry to France, the second is detained by the customs officials at the point of final departure of the car from France, and the third section is retained by the member to be presented finally, personally or by mail, to the touring club, whereupon his deposit is refunded at once without the delay and inconvenience which so often attend repayment of such a deposit at the custom-house.

Among the other advantages of the "Triptyque" for an American is that he can obtain it by correspondence in advance, and then on landing he is enabled to pass the custom-house at once with his auto without annoyance or payment of money.

In France, Germany, and Belgium the "Triptyque" is valid for a period of one year from its date; in Italy and Switzerland for six months only. During the period of such validity the holder of a "Triptyque" may make any desired number of trips into and out of the country designated, unless it be Germany, where only one voyage during the year is permitted. The "Triptyque" is not recognized in Spain or Austria, and is not necessarily in Holland or Great Britain.

The License to Drive an Automobile.

Having secured the admission of his car and the permission to have it placed in circulation, the next important step for the visiting motor tourist should be to obtain a "Certificat de capacité," or license to drive an automobile in France. Theoretically, this is made somewhat easier for foreigners than for a native of the country, but this courtesy, which seems so gracious at the outset, is no protection against the results of

ignorance or incapacity, and it is therefore advisable that every American who desires to traverse this country with an automobile, either imported or purchased here, should take the full examination and so qualify himself as to be entitled to all the rights and privileges that a certificate of capacity can secure.

An application for a license or "permis de conduire" should be written on a sheet of stamped paper of the denomination of 60 centimes (about 12 cents). It should be addressed to the prefect of police, give the full name and address of the applicant, and embody in simple, direct form a request to be permitted to pass the examination required to obtain a certificate of capacity to drive an automobile weighing — kilograms, with a petroleum motor, and of the system — (giving the name of the maker). With this letter of application should be inclosed the passport of the applicant (viséed by an American consul in France if issued from any other office than the American embassy at Paris) and his birth certificate, or, if that is not available, a police certificate which is issued from the prefecture of the police, 36 Quai des Orfèvres, called a "registre d'immunité." If the applicant is a resident of France he should likewise inclose with his application a certificate of residence from the commissary of police in the precinct where he resides, attested for identity by two witnesses, and finally two unmounted photographs of himself.

Practical Chauffeur Examination.

Within a fortnight the applicant should receive an official letter requesting him to meet the examiner at a designated time and place, to which he should go in an automobile of the same type as the one described in his application. This examination is a practical one on broad lines laid down in a circular of the minister of public works. The candidate must maneuver the machine in the presence of the examiner (an engineer of the mines department or his delegate). The examiner is directed to pay special attention to the prudence, coolness and presence of mind of the candidate; his judgment of distance, steadiness in steering, ability in changing, as occasion may require; the speed of the vehicle, application of brakes and starting again, and his general ideas about traffic in street and road so far as appreciating the requirements of other vehicles in passing, preceding, following, and crossing. Where steam is the motive power the examination varies somewhat and some theoretical knowledge is necessary.

If the trial is satisfactory and shows the applicant to be capable of managing his machine acceptably, the examiner will generally give him at once a temporary license authorizing him to drive in and about Paris until the permanent "permis de conduire" is issued, which latter is good for the whole of France. This certificate and receipt of declaration describing the car should be always carried by the automobilist when traveling in his vehicle, as they may be called for at any moment, and failure to produce them might subject the delinquent to serious embarrassments.

Numbers, Lights and Speed.

If the automobile is capable of a speed exceeding 30 kilometers (approximately 18 miles) an hour, it must bear in front and rear a tag painted in white on a black ground, and showing its number and the distinctive letter which has been given to the machine to indicate the place or district headquarters where it has been registered. The dimensions of these letters and figures are carefully prescribed by law and regulations. The tags must be so placed as to be clearly

visible, and the rear one so illuminated at night by a reflecting light as to be read as easily as by day. The rear tag may be replaced at night by a lighted lantern bearing the number and letter of the vehicle.

The speed of an automobile in France is limited by governmental decree to 30 kilometers (18 miles) an hour in open country, and 20 kilometers (or 12 miles) an hour in cities and towns. Any speed exceeding this, although it may be leniently considered by the police, is contrary to law and, in case of accident resulting from the excessive pace, liable to get the offender into serious trouble.

A Word of General Advice.

In case of accidents on the road it is of the highest importance that the foreign automobilist should control his temper and preserve the courtesy of bearing toward officials and other persons, for the lack of which nothing atones in France. If another person has been the cause of or in any way concerned in the accident, his name and address, together with those of any witnesses present, should be obtained and written down, the automobilist giving in return his own.

In case indemnity is voluntarily paid for an injury, either real or imaginary, a receipt should be taken, showing that the payment involves full immunity from subsequent proceedings of any kind. Finally, if signaled to stop by a policeman or other official, the tourist should always obey, treat the delay as good-naturedly as possible, and if summoned to appear before a court he should never fail to do so, either in person or by attorney.

When an American hires in Paris or elsewhere in France an automobile for the purpose of making a tour in this or adjoining countries, and when (as is usually the case) the person or firm furnishing the vehicle supplies also a chauffeur, a carefully drawn contract should be made and signed to define clearly the responsibilities of both parties. As this contract may afterward become the basis of proceedings before a French court, it should be written on stamped paper and cover every point that may be likely to come into dispute.

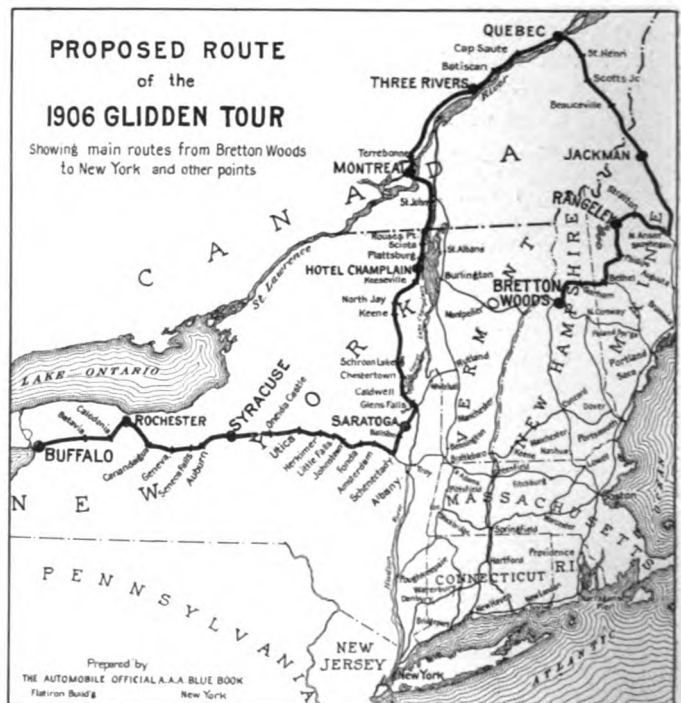
A JERSEY ROMANCE OF THE AUTOMOBILE.

NEWARK, N. J., May 21.—An automobile romance will culminate next September in the marriage of Miss Ella Krueger, a daughter of former Judge Gottfried Krueger, the wealthy brewer, and Inglis M. Uppercu, a member of the Motor Car Company of New Jersey. Miss Krueger and her family sail for Europe next Monday, and August 15 Mr. Uppercu will join them. Miss Krueger moves in Newark's best social circles, and her hand was sought by suitors on every side. But Mr. Uppercu, through whose firm the former judge purchased a car for his daughter's use, succeeded in winning her heart, the courting at first being done in an automobile. A year or more ago Judge Krueger's children—he has seven, some married and some living at home—became interested in automobiling. The judge bought them all cars, including Miss Ella Krueger. The latter's was an Autocar, for which the Motor Car Company has the New Jersey agency. In the demonstrations preceding the purchase Mr. Uppercu was Miss Krueger's instructor, and after the sale was effected he continued giving her lessons. The suspected engagement was finally formally announced. Mr. Uppercu is well liked by his business associates, and the wedding next fall will be one of the social events of the season. Mr. Uppercu is a charter member of the New Jersey Automobile and Motor Club.

Accurate estimates of the consumption of rubber by the principal countries of the world last year placed the United States at the head of the list, with 26,470 tons. Germany was next, with 12,800 tons, and Great Britain with 10,000. What proportion of this enters into the construction of tires the Government reports do not state, but is large.

DETAILS OF THE A. A. A. TOUR.

While the information which thus far has come from the Touring Committee of the American Automobile Association has not given the positive details of the route, enough has been made public to supply the general outlines of the 1906 run, the principal feature of which will be the contest for the Glidden trophy. The Chicago-Buffalo section of the tour will not be concerned with the Glidden trophy, the rules concerning it not beginning until the departure from Buffalo. Chairman Paul Deming of the Touring Committee, having found it impossible to make a preliminary tour of the route, has designated other members of the committee to do the task, which is now in progress. It is probable that all the details will be made public in the next week or ten days, but herewith are given a map that will be found substantially correct and also a tentative schedule and mileage from Buffalo to Bretton Woods.



Probable Itinerary from Buffalo to White Mountains.

Probable Dates	Points Covered	Miles.
Thursday, July 12—	Buffalo to Rochester.....	75 1-2
Friday, July 13—	Rochester to Syracuse.....	97
Saturday, July 14—	Syracuse to Saratoga.....	154
Sunday, July 15—	Remain in Saratoga.	
Monday July 16—	Saratoga (to Schroon 63 miles) to Lake Champlain Hotel.....	135
Tuesday, July 17—	Lake Champlain Hotel to Montreal....	85
Wednesday, July 18—	Remain in Montreal.	
Thursday, July 19—	Montreal to Three Rivers.....	94
Friday, July 20—	Three Rivers to Quebec.....	81
Saturday, July 21 and Sunday, July 22—	Remain in Quebec.	
Monday, July 23—	Quebec to Jackman, Me.....	112 1-2
Tuesday, July 24—	Jackman to Rangeley Lakes.....	80
Wednesday, July 25—	Remain at Rangeley.	
Thursday, July 26—	Rangeley Lakes to Bretton Woods	115
Total Mileage		1,029

A movement is on foot in Kansas City to raise the license fee for dramshops from \$750 to \$1,000 or \$1,250 a year. There are now about 625 saloons in a city of 300,000. The county gets \$500 of the license fee as a macadam road fund and has built some 200 miles of road during the past ten years. The increase of license will tend to reduce the number of dramshops and hence the road fund, practically all of which comes from the city.

SELF-STARTING IS A FEATURE OF THIS CAR

EMBODYING a number of unusual features, the cars built by the Matheson Motor Car Company, Wilkes-Barre, Pa., are attractive from the viewpoint of the engineer as well as to the automobilist. The Matheson is built in three models, so far as the chassis is concerned—30-35 horsepower, 40-45 horsepower and 60-65 horsepower—the popular modern power ratings—

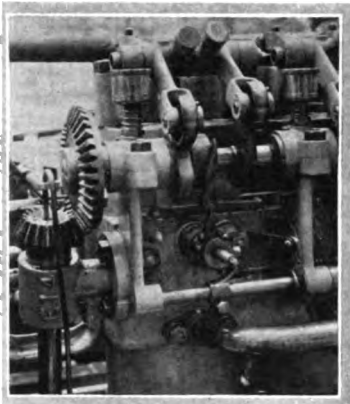
practically the only differences in the three models being in the dimensions. Many different styles of bodies can be fitted, however, such as limousine, landaulet, victoria or the popular modern two-passenger body, the latter being listed as a regular model.

The Matheson motor is of the four-cylinder vertical four-cycle type, water-cooled, and is normally run at a rather low speed. The cylinders are individually cast and have integral water jackets; but the heads,

of noticeably solid construction, containing the valve chambers, are separate castings bolted to the cylinders. The heads are thoroughly water jacketed, waterports permitting water to flow from cylinder to head and vice versa. The valves, all mechanically operated, open directly through the heads and are operated by rocker arms, whose outer arms carry large steel rollers bearing on cams on the single camshaft that operates all

the valves. The camshaft runs in bearings just under the rocker arms and is driven by a vertical shaft and bevel gears, the shaft and cams all cut from a single piece of steel, avoiding the necessity for pinned or keyed cams. The rocker-arm rollers are very large, so that they rotate slowly on the cams and do not wear with any noticeable degree of rapidity, either upon the contact faces or on their pins. Valve springs are all exposed and can be easily reached for removal if necessary. The valve chambers are surrounded by water spaces of unusually large size, and the jackets extend all the way round the chambers, the result being that the valves are kept very cool, comparatively speaking, and are remarkably free from pitting. The manufacturers state that under ordinary conditions the valves never require grinding. The position and arrangement of the valves and the valve-operating mechanism will be readily understood from the accompanying illustration showing these parts. Inlet and exhaust valves are of the same size and are interchangeable.

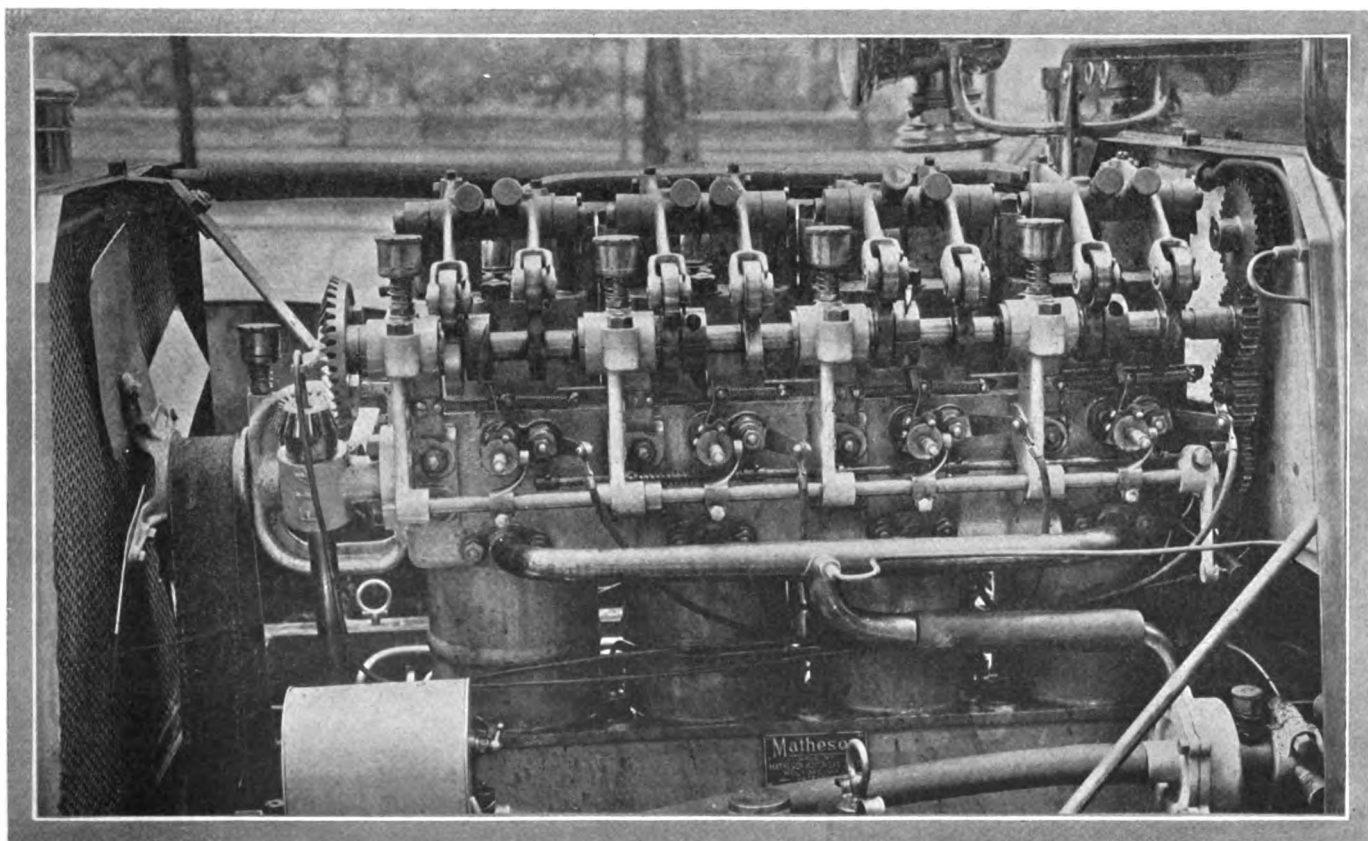
Ignition is effected by a mechanical make-and-break system, the igniters being tripped by cams carried by the valve camshaft. The spark occurs in the combustion chamber, not in a valve pas-



VALVE AND IGNITION GEAR



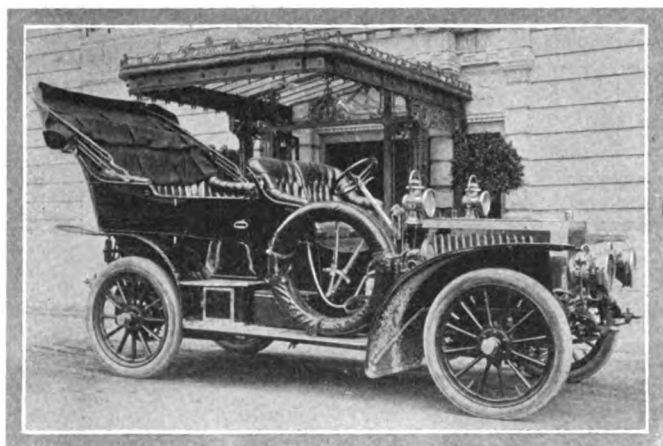
SPRING HANGER OF CAR.



VALVE AND IGNITION SIDE OF MATHESON 40-45 HORSEPOWER SELF-STARTING MOTOR.

sage, and gives an exceedingly large and hot spark. An interesting fact in this connection is that the sparking points, both stationary and moving, are of plain steel, having no platinum or other non-oxidizing tips. The makers state that the steel points wear almost indefinitely and give no trouble, owing largely to the complete combustion of the mixture and the freedom from carbon deposits. The time of ignition is fixed while running, being slightly advanced; in starting the motor, however, the spark is automatically retarded and back kicks avoided. Current is furnished by a magneto for regular running, and by dry cells for starting; the magneto is gear driven from the crankshaft and will furnish a sufficiently strong current to enable the engine to be started by cranking without the use of the battery. One of the special features of the Matheson engine, however, is that cranking is not usually needed, the engine being started on the spark from the seat; for this purpose the battery is, of course, necessary. The magneto is switched in as soon as the motor is running.

While most four-cylinder motors fitted with jump-spark ignition can be started on the spark, there is much uncertainty in the operation, and there is a possibility of the motor starting backward. The Matheson starting device is designed to make starting from the seat as nearly certain as possible and to avoid any chance of starting backward. A spindle, gear driven from the camshaft, runs along the engine from end to end close to the



MATHESON 40-45 HORSEPOWER TOURING CAR.

igniters. This rod can be slid longitudinally in its bearings by means of a foot button on the dashboard. The rod carries four fingers, one for each igniter, and these fingers are so located that when the rod is moved forward by pushing the foot button, the igniter will be tripped on that cylinder, which is just ready to commence a down stroke after having compressed a charge. The right igniter must always be tripped, and as long as there is a charge in the cylinder the engine will start—assuming, of course, that everything is in good order. The fit of the piston and rings is given special attention in order that compression may be held for as long a time as possible; it is stated that the Matheson engine will often hold compression over night. The entire engine is designed with the idea of avoiding distortion under heat; the cylinder casting is round, having no pockets or irregularities cast on it, and expansion is thus kept equal at all points. Three rings are fitted, but the fit of the piston itself is mainly depended on to retain the compression.

The engine drives through a multiple disk clutch, a three-speed sliding-gear transmission, countershaft and side chains to the rear wheels, which are, of course, mounted on a dead axle. No less than fifty steel disks are used in the clutch. This gives a frictional area so great that the wear is practically negligible. Ordinarily no mechanical adjustment of the clutch is necessary, and a curious and interesting method of regulating the slip is used. If the clutch is found to be slipping too much before taking hold, the oil in the clutch case is thinned by the addition of a little

kerosene, or else thinner oil is put in. If the clutch takes hold too quickly thicker oil is used. The idea is that a thin oil allows the disks to get into contact quickly because the thin oil is readily squeezed out, while a thick oil is more difficult to work out and the slip is consequently continued longer.

The gears and shafts of the three-speed sliding-gear transmission are of chrome-nickel steel, and all the parts are made very heavy and strong. The shafts run on annular ball bearings. A single progressive lever controls all the gear positions. A heavy sheet-steel pan extends from the front end of the frame, just under the radiator, to the rear end of the transmission gearcase, and effectually protects the working parts from dust and mud. A trap-door just below the engine permits the removal of the lower half of the crankcase and the inspection of cranks and connecting rods. The bevel driving gears and the differential on the center of the countershaft are inclosed in a rearward extension of the transmission gearcase and run on ball bearings. Both front and rear axles are steel forgings of square section. The steering knuckles are of the Lemoine type and turn on annular ball bearings.

Brakes are fitted to the countershaft and to the rear wheel hubs. The countershaft brakes are operated by pedal, and are the regular service brakes; they may be water-cooled if desired, water receptacles being provided for the purpose. The hub brakes are intended for emergency use and are set by a side lever. In applying the emergency brakes the countershaft brakes are set automatically at the same time, the connections being interlocked. A ratchet and pawl arrangement in the rear hubs acts in place of the old-fashioned sprag, to keep the car from running backward down hill, and is controlled from the driver's seat.

The carbureter is of a peculiar type, having no float; gasoline is fed to it by a gear-driven rotary pump, the excess being returned to the tank by gravity. An interesting feature of the carbureter is that there are three spray nozzles all under the control of a single automatic valve. At low speed the valve opens sufficiently to bring only one spray into use; and as the engine speed increases and more fuel becomes necessary, the second spray is also opened up, all three being used only for very high speeds. The engine runs under governor; a throttle in the supply pipe between the carbureter and the engine can be controlled by a lever on the steering wheel, and also by a small pedal.

The frame, of the usual tapered channel form, is of nickel steel and is carried on four semi-elliptic springs. One of the interesting features of the car is the manner in which the ends of the springs are attached to the frames. Instead of the customary curved spring hangers, each end of each spring is shackled to a lug which is free to slide fore and aft on a short piece of steel rod, the lug being bored a sliding fit for the shaft. The rods at the front ends of the front springs and at the rear ends of the rear springs are riveted at their bases to the ends of the main frames, from which they extend; at the opposite end the rods are supported between brackets riveted to the frames. With this arrangement it is impossible to put a twisting stress on the springs, as the sliding lugs can rotate as much as necessary on their shafts to take care of the relative motion of axle and body when, for instance, one wheel drops into a deep rut while the other remains on the level road. The alternate lengthening and shortening of the springs as they rise and fall under the influence of rough roads is, of course, taken care of by the sliding lugs. The rear springs cannot transmit any driving power from the rear axle to the body under this arrangement, so stout radius rods are provided for this purpose. The front ends of the front springs do not slide on their rods, the lugs being free to turn only. The manufacturers state that this arrangement of the spring hangers saves many broken springs.

The body is fitted with every convenience for touring and is extremely roomy and comfortable; the total seating capacity is seven passengers, the rear seat being wide enough for three and two folding seats carrying two more, in addition to the two in the front seats. The equipment of the car includes gas and oil lamps, the former being large and powerful.

A TYPICAL MODERN NEW YORK GARAGE

It was not very long ago that the proprietor of a garage in the metropolitan district thought he had an establishment worth boasting about if he occupied the entire ground floor of an abandoned livery stable, perhaps, for storage, repair work, office and salesroom. Times have changed, however, with the growth of the industry, and the idea of what constitutes an up-to-date garage has changed also; how great the change has been is indicated, in one case at least, by the new garage recently opened on Ninety-third street, between Central Park West and Columbus avenue, by Graham & Goodman.

The garage is built throughout of reinforced concrete and is, of course, fire-proof, very little wood being used. There are three stories and basement, 100 feet deep and 50 feet wide, and at the rear is a wing or "L" 30 feet by 40 feet. In the basement, which is the full size of the building, are the electric motors for the huge elevator that runs from the bottom to the top of the building and for the air-pump, by which a constant air pressure, for inflating tires, is automatically maintained in a receiver. The main floor is used for live storage and the wing is set apart as a shop for chauffeurs and owners who desire to do their own work on their cars. The ground floor is used for the live storage of cars that are most frequently in use. On this floor are located the offices, at the front, near the great doors, while opposite the offices is a comfortable and convenient room fitted up for the use of ladies—and the room is much used. The charging plant is on the main floor also, with a switchboard for charging fifteen electric vehicle batteries at the same time. A large turntable just

in front of the elevator doors permits a car to be turned in any direction that may be desired by the operator.

The main area of the second floor is used for live storage, while the wing is given over to the chauffeurs. Here are steel-ventilated lockers around the walls, bathroom with shower bath and all the latest conveniences of the plumber's art, that will be appreciated by chauffeurs after a hot, dusty run. The third or top floor is given over to repair work, and on it are facilities for doing work of all kinds, up to the practical rebuilding of a car, including the body work. Forging, machine work, body building, upholstering, painting, battery work, are all done on the top floor. At the time the accompanying photographs were taken twelve cars were having new bodies built and undergoing a thorough overhauling; this gives a good idea of the capacity of the department, though there was ample room, apparently, for simultaneous work on twice that number of cars, in addition to minor repair work.

A great deal of glass is used in the building, and the natural lighting is consequently good; and for night work and getting under cars there are numerous electric lights. Electric portable drills are used in the machine shop with excellent results. Washing stands, with revolving washers overhead, are on every floor. The total capacity of the garage is 250 cars, and machines of every type—gasoline, steam and electric—can be cared for. While the interior of the garage is severely plain and businesslike, the street front is ornate. The large area of glass in green metal framing, and the automobile in cement work that tops the whole, give the building a distinctive appearance.



THIS GARAGE HAS AN ARTISTIC AND IMPOSING FRONT.



GROUND FLOOR OF GARAGE SHOWING ENTRANCE TO ELEVATOR.



LOOKING TOWARD FRONT OF BUILDING ON SECOND FLOOR.

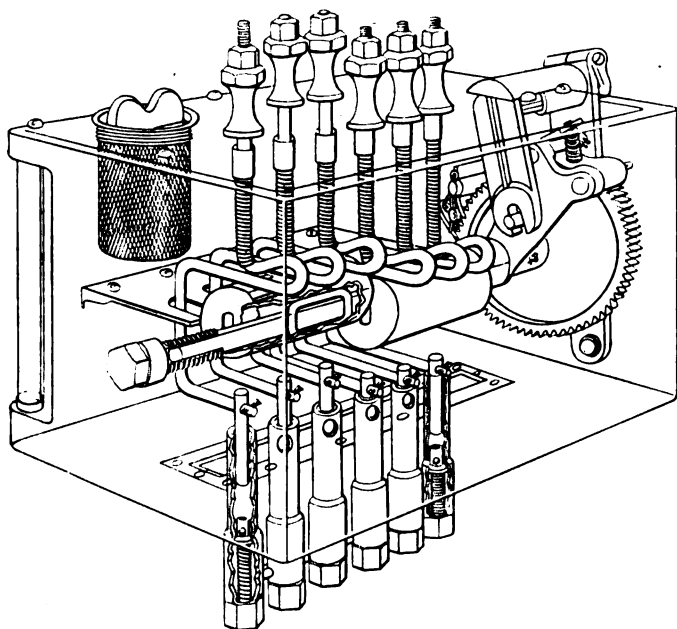
A MOTOR-REGULATED OILER.

The Kinwood oiler is a mechanical oiler and can be driven in any of the usual ways. The operating connection being at the top of the oiler, the necessity for stuffing-boxes is dispensed with, as it is the only opening in the body, and, in connection with another arm in the body, operates the pawl-and-ratchet device. Individual pumps, corresponding to the number of lead tubes, are secured to the bottom of lubricator and operated in batteries of two or more by the revolving eccentrics so mounted on the ratchet shaft that the downward stroke has a quick action, regardless of the speed of motor, with the object of insuring a strong pressure stroke at all speeds.

The ratchet wheel and dogs, which appear to be the only parts subject to wear, are proportionately large, with wide, hardened wearing surfaces. The double dog arrangement, moving one half tooth at each revolution of the cam or driving shaft, does away with the worm gear or any special arrangement for speed reduction from motor to oiler, whether driven by eccentric or pulley. The plungers are each connected by yoke projecting through the top of oiler, and the action of each pump can be seen at all times, and is regulated from the outside by means of lock nuts, without stopping the motor, and, when desired, any pump can be worked by hand without changing the regulation. The body has gauge glass at one corner and filler opening is provided with strainer. One peculiar feature of construction is that no screws are used inside of body.

The oilers are made in size from two feeds upward, with brass, aluminum or iron bodies. They can be mounted on the dash or under hood, as desired. A special feature set forth by the manufacturers is that the Kinwood is an oiling system that will deliver to each bearing, whenever the motor is running, any desired quantity of oil in proportion to the speed of the motor. Each feed of the oiler can be regulated from half a drop to fifteen drops for every 320 revolutions of the driving shaft. It will start the instant the motor starts and ceases feeding instantly the motor stops.

Among the other claims made for the Kinwood is simplicity and strength, no part being subjected to unnecessary wear; not

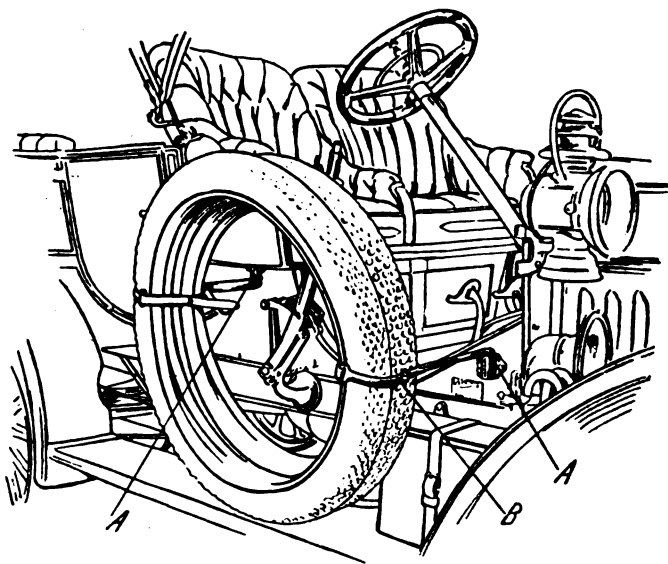


VIEW OF KINWOOD OILER'S INTERNAL MECHANISM.

easily disarranged, but easily accessible, if necessary; large oil capacity in proportion to bulk, gives pressure when needed and as needed by each individual lead, and having no stuffing-box below the oil level cannot leak. This oiler is one of the latest of the well-known line of Kinwood specialties produced by the Kinsey Manufacturing Company of Dayton, O.

REMOVABLE TIRE CARRYING DEVICE.

Until the pneumatic tire has been made invulnerable, or has been supplanted by some less fragile device, the prudent automobilist will never tour without at least one spare tire, and will feel more comfortable, on long trips, if he has two. The problem of carrying tires, however, is a difficult one, and numerous solutions have been tried with varying degrees of success. One of the latest devices, and one that



is apparently exceedingly practical, is the McKinney tire holder, the general agents for which are the New England Branch Peerless Motor Car Company, 178 Columbus avenue, Boston. This holder, though shown in the line engraving with two tires, carries a single tire equally well, without extra parts or unnecessary bulk. Two brackets, *A A*, attached to the body of the car, form sockets into which the holder arms fit. Each arm has a pair of jaws which embrace the tire or tires; and by means of the hinge, *B*, the jaws can be made to fit either one or two tires, of any size. The jaws terminate in loops through which the straps are passed to hold the tires firmly in place. In case the car is to be used for short runs, making the carrying of an extra tire unnecessary, the arms can be removed from the sockets without removing the tire from the jaws, and the whole can be replaced when wanted in a very short time. The arms are of course made long enough to carry the tire or tires clear of the gear-shifting and emergency brake levers.

SELECTIONS FOR A. A. A. LAW COMMITTEE.

Secretary S. S. Gorham of the A. A. A. has announced the names of thirteen members of the Law Committee of the national body. The list is not complete as yet, for it is Mr. Gorham's desire to make it a thoroughly national committee. The men just appointed will act as sub-chairmen in their districts, and will work in conjunction with Mr. Gorham in endeavoring to get a national automobile law. Those chosen follow: Osborne Yellott, of the Automobile Club of Maryland; Homer H. Johnson, of the Cleveland Automobile Club; A. H. Darnell, of the Atlantic City Automobile Club; Frank B. Finney, of the Portsmouth (O.) Automobile Club; C. H. Burras, of the Austin (Ill.) Automobile Club; J. J. Seeds, of the Automobile Club of Philadelphia; James F. Drought, of the Milwaukee Automobile Club; W. P. Richardson, of the Long Island Automobile Club of Brooklyn; S. P. Irwin, of the Bloomington (Ill.) Automobile Club; F. W. Battershall, of the Albany (N. Y.) Automobile Club; W. R. Hickox, of the Kankakee (Ill.) Automobile Club; W. H. Chase, of the Wachusett (Mass.) Automobile Club; F. H. Hurtubis, Jr., of the Massachusetts State Automobile Association.

ACTIVITIES AMONG THE AUTOMOBILE CLUBS

Missouri's Farmers Assist the Automobile Clubs.

KANSAS CITY, May 17.—The fact that farmers dislike automobilists in some states and go so far as to do them bodily harm, is regarded with nothing but surprise by the Missouri farmer. He has the right idea of the automobilist. To the farmer, the pneumatic tire means the coming of good roads, and so, instead of opposing the automobile, he is forming alliances with it.

The first move of this kind has been made in Jackson county, in which this city is situated. Half a dozen towns in the county have importuned the Automobile Club of Kansas City to take the initiative for more macadam roads, and for the repair of those already in existence. In this course the farmers have promised their heartiest support. As the county court, which has supervision over the expenditure of the road money, holds its sittings mainly in Kansas City, the farmers believe the club has a better opportunity to present the case of roads improvement. Arrangements are now under way for a meeting to be held by the club in a few weeks to make plans for an active campaign. While there are some excellent roads in the county, the approaches leading from the city are almost uniformly bad.

While the club is aiding the man with the horse and buggy, it has a nice little axe of its own to grind. Good eating houses are few and far between, and the accommodations for the tourist are meager. The club wants a farmer about twenty miles from the city to fit up a place where one may get a good meal. As the "lid" is screwed and bolted down in Missouri on Sundays, the small towns present nothing but a pitying look to the automobilist who is hungry after a long tour. Already Oak Grove, a small town some thirty miles from here, has agreed to establish a place of this kind if the club will get the roads repaired to its borders. The club will thus be killing two stones with one bird, which isn't exactly as the old saying expresses it.

Automobile Club of Germantown Has an Election.

PHILADELPHIA, May 21.—There was a big turnout at the artistic clubhouse of the Automobile Club of Germantown tonight, the occasion being the annual election, supplemented by a supper and smoker. As there was but one ticket in the field, there were no contests, the new officers being: President, Thomas B. Prosser; vice-president, Charles H. Thompson; secretary, Mark B. Reeves; treasurer, Robert P. Hooper; new members of the Board of Governors, John B. McIlhenny, Clarence B. Collier and William E. Helme. The annual reports of the board of officers showed the club to be in fine condition financially.

Energetic Club Action Against Reckless Driving.

TACOMA, WASH., May 17.—The Tacoma Automobile Club, at its last meeting, passed a resolution, requesting the chief of police to enforce the State automobile speed law. This action is the result of a number of aggravating cases of fast and reckless driving, which is placing the entire automobile contingent here in disrepute. The State law is all that the city authorities are permitted to operate under, a maximum speed for cities being placed at twelve miles an hour. Two well-known men, who, however, are not members of the club, have been acting very badly on the road of late, and only last Sunday morning one of them ran into a tree, completely demolishing his machine, and the wonder is that none of the three occupants of the car was killed. The accident is recognized as being the result of reckless driving, and the police force, as well as the club, is aroused. The other man is a hotel owner, whose chauffeur is recognized as being exceedingly reckless, and both have boasted about deeds on the road. The club is willing to lend any assistance in procuring evidence against these men.

At its meeting the club devoted considerable time to good roads matters. In this particular, it is the only live automobile organization on the North Pacific coast. During the past week it has had a man out on the prairie road, reducing some of the rough spots. W. W. Pickerill, president of the club, announced that he had that very day been out and nailed up the first automobile danger sign on the North Pacific coast. It is at the top of a dangerous hill towards American Lake.



W. W. PICKERILL PLACING FIRST DANGER SIGN ON PACIFIC COAST ROADS.

The club has had a number of signs painted according to the code of the American Automobile Association, and the officers of the club were authorized to engage a man to place them in their proper locations in the country.

The club is now in a flourishing condition, the present membership of 64 being twice that of automobile owners in the city last year. Tacoma also boasts of being the most progressive city in this section of the country and owns more large cars than either Seattle or Portland. The opportunities for automobiles here are the very best, the only trouble being the lack of a good route to the prairie roads. An entirely new and better route than the old one will be secured when Sixth avenue has been paved, which will connect with Union avenue, and thence to South Tacoma. Sixth avenue can be reached by an easy paved grade.

Gates' Mills Hill Climb Set for May 30.

CLEVELAND, O., May 21.—Decoration Day will witness the second annual hill-climbing contest under the auspices of the

Cleveland Automobile Club, on the Gates' Mills hill, the scene of last year's contest. The hill is an ideal grade for a contest of this kind. It is over a mile long and has an elevation of 450 feet in the mile, which is considerably more severe than either Eagle Rock or Dead Horse hill. Last year, with the hill in very rough condition, Frank B. Stearns, with a 40-horsepower stripped touring car, won the mile contest in 1:19 4-5. Gates' Mills lies in a beautiful valley 16 miles east of Cleveland, and the club has arranged to meet in a body and have a parade to the resort. The hill has been graded and leveled off during the past few weeks, and it is in much smoother condition than it was last year. Local dealers are much enthused over the prospects of the hill climb and already there are a number of entries in from the local people. Entries close Monday, May 28, with Asa Goddard, at the clubrooms, Hollenden Hotel.

Chicagoans Are Up and Doing These Days.

CHICAGO, May 21.—Photographs from the architects' plans show the new home of the Chicago Automobile Club, to be



ARTISTIC FRONT OF THE NEW CHICAGO A. C. HOME.

erected on Plymouth place, between Jackson boulevard and Van Buren street, to be a handsome five-story structure of Colonial type. Provision is made, not only for the special needs of automobilists, but also for the wants of members who may desire to have at hand the privileges commonly provided in clubhouses of high class. Situated in the heart of the office building and retail centers, it has been thought advisable to devote a large amount of space to the cafés, of which three will be provided. While the interior furnishings and decorations will be unique and handsome, comfort will be the first consideration. The garage will accommodate about ninety machines. Storage for cars will be in a building in the rear, separated from the main building by a brick fire-wall, extending from the basement to the roof.

The membership of the club is nearly 600, forty having been taken in during the past month. June 12 will occur the annual Orphans' Day run, and hundreds of the little ones will be given a treat. President Farson has added C. A. Coey and B. H. Marshall to the Racing Committee of the club, and Jerome A. Ellis has been made an additional member of the

Runs and Tours Committee. The touring contest will probably be held in August, with the route from Chicago to Milwaukee to Rockford and back to this city. Ten prizes will be included in the list, among them being the Ralph Temple cup, which will go to the winner. Other prizes will be awarded for various features, such as reliability, economy of fuel consumption, and endurance. A theater party was held at the Garrick Theater Friday, and features of interest to enthusiasts were introduced in "Mexicana." A tour to Highland Park is on the calendar for May 26

Portlanders, of Oregon, Granted More Speed.

PORTLAND, ORE., May 21.—The opening of the automobile season in the city of Portland and vicinity has been marked by auspicious circumstances. The Automobile Club of Portland held its annual meeting some two weeks ago and appointed a committee to visit the city council and lay before that august body a desire for a rearrangement of the speed limits. A speed of eight miles an hour has prevailed in the corporate limits of the city, which was not very pleasing to enthusiasts, who argued that it was impossible to adhere to this law at all times. A graded speed limit in certain districts was asked for, that outside of the fire limits being fifteen miles an hour. The ordinance was presented to the council and passed with hardly a dissenting vote. The city council has learned that the automobile has come to stay, which entitles owners and operators to certain rights and privileges in the matter of legislation.

The election of officers resulted in the selection of the Hon. Robert D. Inman as president. The retiring president, Sol Blumauer, was placed on the board of directors. Action by the club which met with instant approval on the part of the members present was the repeal of the rule against permitting dealers to serve on the board of directors. This rule was incorporated in the bylaws at the club's inception owing to the belief that dealers would prove antagonistic to each other and would bring their differences into club matters, but this has been found to be wrong. Henry M. Covey and Harry L. Keats, identified with the trade, were elected members of the board. Secretary David T. Honeyman and Treasurer Dr. C. B. Brown were re-elected to their respective offices.

Pennsylvania Clubs Working for Trans-state Highway.

PHILADELPHIA, May 21.—Interest in the proposed trans-Pennsylvania highway between this city and Pittsburg is increasing day by day. At the Good Roads Association's office a force is at work sending out appeals to every man of prominence who would be in any way benefited by the new road. Already the responses are beginning to come in. The York County Automobile Club is at work in an effort to arouse interest in the section of the road which bisects York county. The Lancaster Automobile Club is also busy along the same lines.

Gettysburg citizens and farmers along the route, both east and west of the great battlefield, have also been heard from, and a special appeal is in preparation calling attention to the facts that Gettysburg has become the shrine of a nation, that upward of 100,000 tourists visit that place annually, and that the completion of the great road will mark the beginning of a great tide of travel to the battlefield from East and West.

One of the first moves of the executive committee of the association, of which President Dick of the Automobile Club of Philadelphia is chairman, will be the calling of a convention in Harrisburg, of the County Commissioners of all the fourteen counties through which the highway will run, and endeavor to bring about combined action on their part in securing from the state good roads appropriation their full shares, and the devotion of the bulk of their counties' proportion of the money to the improvement of the new highway.

President Woodworth Succeeds Himself at Rochester.

ROCHESTER, N. Y., May 21.—Six annual meetings have been recorded in the history of the Rochester Automobile Club, and the recent one excelled in point of interest and attendance all its predecessors. Senator W. W. Armstrong, F. H. Elliott, secretary of the New York State Automobile Association, President Brown, of the Syracuse Automobile Club, and President H. A. Meldrum, of the Buffalo Automobile Club, were guests. The report of the secretary showed a membership of 203, a net increase for the year of 47.

The election of officers for the ensuing year resulted as follows: President, Harry S. Woodworth; vice-president, Henry G. Strong; secretary and treasurer, H. Seymour Bentley; attorney, John A. Barhite; consulting engineer, A. J. Rockwood; directors, Griff D. Palmer, F. H. Bettys, Lee Richmond, F. E. Mason, A. F. Crittenden, J. S. Bingeman, G. G. Foster, William C. Barry, Jr., and Rudolph Schmidt.

Macon's Successful Meet Will Be Held Annually.

MACON, GA., May 21.—The closing of the three-day meet of the Macon Automobile Club, on May 12, was marked by a brilliant social function at the Log Cabin Clubhouse, in this city, on the evening of the day mentioned. Hon. B. L. Jones, president of the club, received the guests, and dancing and refreshments were a part of the program. The club is enthusiastic over the success of its first meet, and has practically decided to hold the event annually in May. Central City park track was used for the meet, and large delegations of automobilists drove from Atlanta, Savannah, and neighboring cities and towns. Most of the events were won by local drivers, and the fastest time made was by Edw. H. Inman's 50-horsepower Stearns, driven by John Toole, who won a four-cornered match race at 5 miles in 5:58, record for 1-mile circular track. A separate mile was done by the same car in 1:05.

Bisons Active in Repressing Speed Violations.

BUFFALO, May 21.—Resolutions have been adopted by the Automobile Club of Buffalo deploring high speed of automobiles within the city limits. The members of the club have been doing everything within their power to stop the reckless driving of automobiles. Only a short time ago H. A. Meldrum, president of the club, appeared in Police Court, in behalf of the club, against a chauffeur who drove down Main street, in the business section, at the rate of 30 miles an hour. Complaint has been made about some reckless and inexperienced chauffeurs, who test the speed of their cars in Delaware Park, thus endangering the lives of pedestrians and more sensible drivers of machines.

Flour City Automobilists Open New Club Rooms.

MINNEAPOLIS, MINN., May 21.—The handsome new club rooms of the Minneapolis Automobile Club were formally opened last Friday evening. The club has secured a lease of an entire floor of the Plaza Hotel, and the rooms have been fitted up in the most modern style possible, containing a large, fully equipped billiard hall, a buffet, a lounging room, and several other minor rooms, all of them fitted with a view to the greatest comfort of the members.

Mayor Dunne Will Be Guest of Austins.

AUSTIN, ILL., May 21.—The annual tour of the Austin Automobile Club will be held June 9. A meeting of the club was held Tuesday night, and it was decided that the run extend over many of the principal boulevards and parks of the north and west sides of Chicago. Mayor Dunne has accepted an invitation to participate in the tour as a guest, and invitations have been sent to Governor Dineen and members of the West Park Board.

Floral Parade and Orphans' Day at Pittsburgh.

PITTSBURGH, May 21.—Following the annual Orphans' Automobile day, June 5, the Automobile Club of Pittsburgh proposes to have a mammoth floral parade, probably about June 15, in the height of the rose season. The affair will not only be a very costly novelty in this city, but as proposed will be one of the most beautiful sights ever witnessed in Pennsylvania. Over 100 cars are assured for the parade. Two \$100 prize silver cups have already been offered for the best decorated cars, one by the Pittsburgh Country Club and the other by the Automobile Club of Pittsburgh. The proposed route is along the main streets and boulevards of the East End out to the Country Club on Squirrel Hill. It is likely that the Hotel Schenley, at the entrance to Schenley Park, will be the rendezvous.

Tennessee Has a New and Considerate Club.

MEMPHIS, TENN., May 21.—Twenty-seven automobile owners met Friday night and organized the Memphis Automobile Club. The officers are among the most prominent men in Memphis, and owners or part owners in machines only are eligible for membership. The object of the association is to promote the rational use of automobiles and to observe and encourage the observance of municipal ordinances.

The following officers were elected to serve the ensuing year: President, S. T. Carnes; vice-president, A. S. Caldwell; secretary, Harry Liggett. The board of control is composed of P. P. Williams, chairman; J. A. Omberg, Jr., F. F. Hill, W. F. Yates and J. Falls.

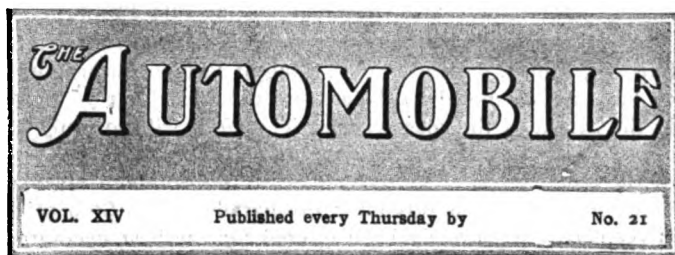
CLUB DOINGS IN GENERAL.

WICHITA, KAN.—An organization has been perfected here to inaugurate a series of tours and competitive endurance contests, to be known as the Wichita Automobile Club. Six of the owners of large-horsepower cars are the nucleus of the new club, and other automobilists will be invited to join.

ROCKFORD, ILL.—Plans are being formulated by the Rockford Automobile Club and the boat club of this city for the building of a clubhouse to be used by both organizations. A garage and clubrooms for the former organization will be arranged separately from the quarters of the boat club. All will be in one building, and probably on one floor there will be a large hall to be used by both clubs.

WILMINGTON, DEL.—The Wilmington Country Club, which has extensive grounds just outside of the city, has adopted the plan of cutting the grass with an automobile; that is, a motor car is used to draw a mowing machine, which does the work to perfection and without tiring horses. The club's experiment having proved a success, several other people living in that vicinity are also following the same plan, with equal success.

NEW YORK.—Orphans' Day (June 6) celebration plans are being rapidly completed by the tours and runs committee of the New York Motor Club, of which W. J. Morgan is chairman. About 150 cars have already been offered. The parade will be under the direction of Gen. John T. Cutting, grand marshal, with a number of division aides, and there will be several official cars in use as pilot and scout cars. The club hopes this year to take care of at least 1,000 orphans, who will be selected from the various institutions in Manhattan and will be taken to Dreamland, where a day of sight-seeing and enjoyment will be given the little ones. An opportunity has been given this year to defray the expenses of Orphans' Day, and considerable has already been subscribed. Subscriptions to the fund should be sent to R. H. Johnston, treasurer of the club, at 1402 Broadway. Offers of cars with drivers for the day should be forwarded to W. J. Morgan, Bretton Hall, New York City.



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A Touring Committee with an Impossible Task.

It would seem in the case of the National Touring Committee of the A. A. A. that it will be damned if it doesn't provide for the smaller car and likewise damned if it confines the contest for the Glidden trophy to the big touring cars. It will be remembered that the N. A. A. M. committee in despair gave up the attempt to place the big and little cars on an equality in the competition. Without reference to weight, usual touring conditions might be construed to require a tonneau car carrying at least four persons, though it is true that one can travel comfortably and particularly economically in a two-seated runabout. Nevertheless, first-class touring conditions, in the opinion of many, call for the tonneau car, and undoubtedly Mr. Glidden had this idea in view when he offered his trophy. While it might not be generally known, it is a fact that the 1905 Glidden Commission penalized the two-seated runabout in figuring out the winner, though even if this had not been done the runabouts would not have been much nearer the top score. A solution of the problem would be the offering of two distinct trophies—the Glidden trophy for the tonneau car and another trophy for the runabout class. But no matter what plan is tried there will be some dissenters, for the reason that it is utterly impossible to arrive at a fractional equitable adjustment. The idea of the A. A. A. tour is more pleasure than work, and of those who participate few will really care what becomes of the trophy or trophies. But consider the difficult task of the committee and be lenient in your criticism. Serving on the official list of any organization similar to the A. A. A. often is a thankless task at the most, and those who give time and money without recompense should receive liberal consideration at the hands of those who tell the news of automobiling's progress.

Where the Automobilist Should Be Considerate.

From Vermont, in the form of a contribution of a ruralist to his local paper, comes a plain statement of fact that should impress itself upon every fair-minded automobilist who tours in that state, or in any other state where the automobile is an uncommon sight and an unexpected thing when encountered by other users of the road. The rural writer tells the same story that has been told before of the coming of the automobile into new country, reciting the dread of those who still use the horse and must continue to use the same method of conveyance for years to come. In Vermont, where the percentage of aged people is high, many owners of horse-driven vehicles keep off the road as much as possible through fear of danger in meeting inconsiderate automobilists. The Automobile Club of Vermont is preaching, and its members are practicing, regard for other users of the road, and the complaint traces back to tourists from outside the state who often push forward despite the signal of upraised hand and the look of anxiety on the faces of those behind the horse. When traveling in states wherein the automobile has yet to become familiar, the automobilist owes it to his sense of fairness to employ extreme consideration to the horse owner, who some day will substitute the motor-driven vehicle for his present slower mode of travel.



Brake Horsepower Form- ula for Four-cycle Motors.

In this issue is printed an article on the brake horsepower of four-cycle motors. While this is a subject on which much has been written, yet no writer has so far approached the subject from just the viewpoint of this article. While, of course, no formula can be found that will give the power developed on the brake by an automobile engine, we have here considered the piston displacement, the speed, the clearance, and the average mechanical efficiency, leaving only the ignition, the mixture, and the valve design as variables.

As may be seen by the writer's first curve, current practice does not agree exactly with his formula. This may be due to two reasons. First, that the mechanical efficiency of different makes of engines differs. Second, the use of different carbureters and different valve timing will greatly change the proportions of the piston displacement which is filled with mixture each working stroke, also the same engine will take in a different charge volume at different speeds, thus giving a different compression pressure for the same clearance volume.

Although the formula represents a good average of American practice and gives closer results than most of the more empirical formulæ heretofore published, it may not give exact results for any particular engine, for the reasons above mentioned. As the writer suggests, the constant may have to be modified to suit any particular line of engines.



To Cover the Risks of the Road.

Another kind of insurance policy is a necessity that must be met immediately. In the state of Washington recently an assistant attorney-general held that the automobile was a marine risk, while in Louisiana an insurance company declined to pay in the case of an automobilist who was killed, putting forward the ridiculous contention that automobilists were afflicted with a speed mania that subjected them to extraordinary liability of death. A policy that will cover the revised risk of the road, both as to machine and its operator, would appear to have become an essential in automobiling. The day unquestionably will come when automobiles will travel over a specially constructed road which will include a going and a coming lane with a center portion reserved for the slowest travelers. This must be if we are to secure the worth of the time-saving speed of the automobile, and the cost will not prove exorbitant.

FRENCH ENTRIES FOR THE VANDERBILT.

Chairman J. D. Thompson of the A. A. A. Racing Board is not worrying regarding the declination of the Automobile Club of France to assist in the selection of the French team for the Vanderbilt Cup race. The Racing Board has its plan outlined, though it has courteously awaited the receipt of a formal notification from the French club that it would not assist in the premises. There will be five French cars in the Vanderbilt race, and their selection will be made in an equitable manner, according to Chairman Thompson, who intends to sail for the other side early next month and be a spectator of the Grand Prix. A meeting of the Racing Board will be called for next week, but in the meantime preparations are being made for the Vanderbilt event, the success of which will eclipse the great race of last year.

NO RULES YET FOR A. A. A. TOUR.

Chairman Paul Deming of the A. A. A. National Touring Committee on Tuesday wired from Detroit that the rules governing the 1906 A. A. A. tour had not been positively decided upon, nor would they be for several days. The 2,000-pound idea, making cars of less than this weight ineligible for the Glidden trophy, has not been officially adopted, and in fact the sub-committee has simply considered it as a possible line of division between the big and little cars. The principal idea of the committee is a pleasure tour with as few irksome rules as possible.

PENNSYLVANIA FEDERATION AND A. A. A.

PITTSBURGH, PA., May 21.—The recent visits to this city of Sydney S. Gorham, secretary of the American Automobile Association, have stirred up a lively interest as to how best to co-operate with that organization in securing defensive legislation for automobilists. Pittsburgh motorists are willing to co-operate with the national association, but do not wish to lose their independence by so doing. The A. A. A. officials want the Pennsylvania Motor Federation to be allied with it, and it is likely that a working agreement between the two organizations will be effected shortly. The Pennsylvania organization is strongly backed in Pittsburgh, and its supporters do not intend to see its energies diffused so as to lose sight of the few very important improvements in this vicinity which are to be accomplished if possible.

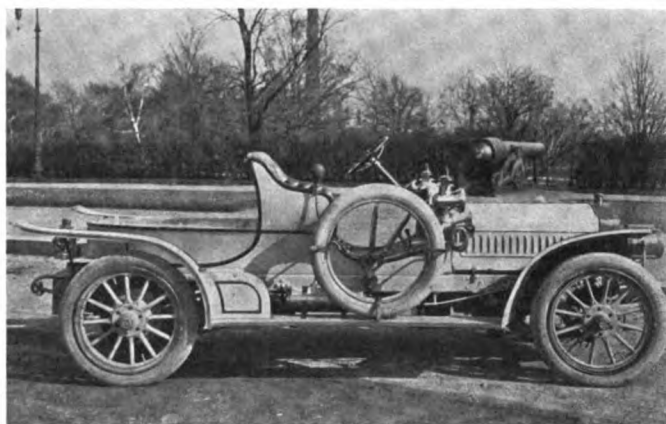
NEW YORK'S OPEN-AIR SHOW.

At the Empire City track, Yonkers, to-day begins the open-air automobile show of the New York Automobile Trade Association, the formal opening being scheduled for 2 o'clock this afternoon, with Dave Hennen Morris, president of the Automobile Club of America, formally setting the wheels in motion. The show will continue Friday and Saturday, and each day there will be contests in the afternoon, the programme being varied and including a daily balloon ascension and parachute jumps.

CONGRESS HAS MANY ROAD BILLS.

WASHINGTON, D. C., May 21.—The present session of Congress, which is now drawing to a close, has been remarkable for the number of good roads bills that have been introduced and for the many stirring appeals that have been made on the floor of the House for legislation that will aid in the improvement of the highways throughout the country.

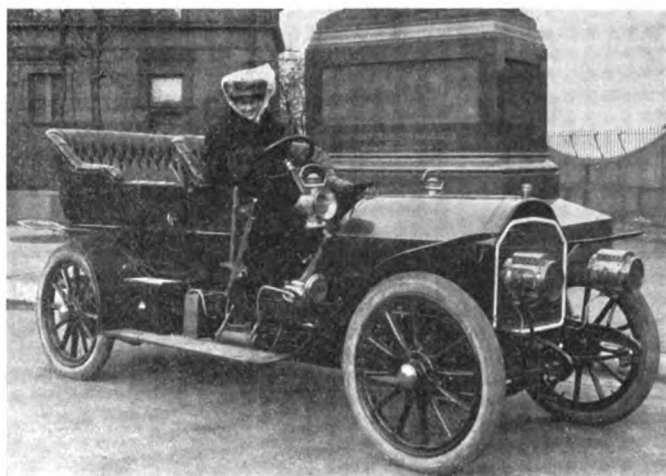
Now comes Representative Sulzer, of New York, with a bill "to promote the construction of good roads and the efficiency of the postal service in the states and territories of the United States." His bill provides that upon the application of the proper authorities representing any state or territory of the United States, the secretary of the treasury shall loan to such state or territory for the construction or improvement of post roads within such state or territory and outside the limits of any city the actual cost of such construction or improvement.



NEW THOMAS FLYER RUNABOUT WITH RUMBLE SEAT.

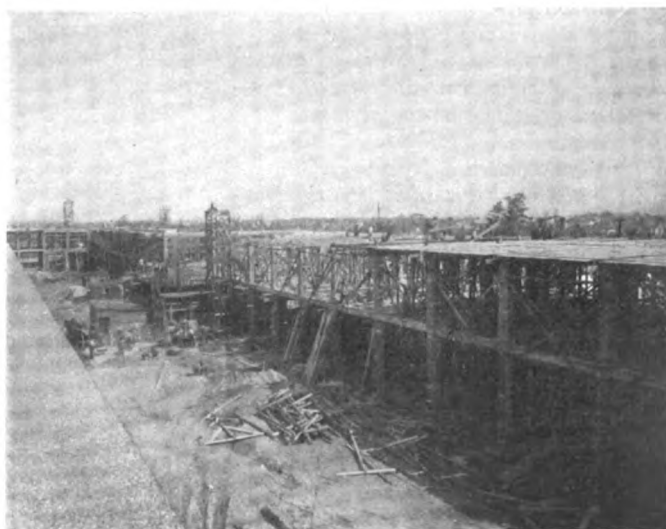
PHILADELPHIA MAY HAVE AN AUTO MART.

PHILADELPHIA, May 21.—If there is anything in the rumors current along North Broad street last week, Philadelphia is to have an "auto mart" constructed on lines somewhat similar to those of Boston's famous establishment. The report had it that



MISS BLANCHE RING IN HER 1906 STEARNS CAR.

those back of the "Hub" concern are also interested in the proposed mart here, and that an option on a piece of property containing 40,000 square feet of ground in the neighborhood of Broad and Arch streets had been secured. Opinion along "the row" seems to favor the erecting of such a building.



LATEST ADDITION TO FACTORY OF PACKARD MOTOR CAR COMPANY, DETROIT—BUILT ENTIRELY OF CONCRETE AND STONE.

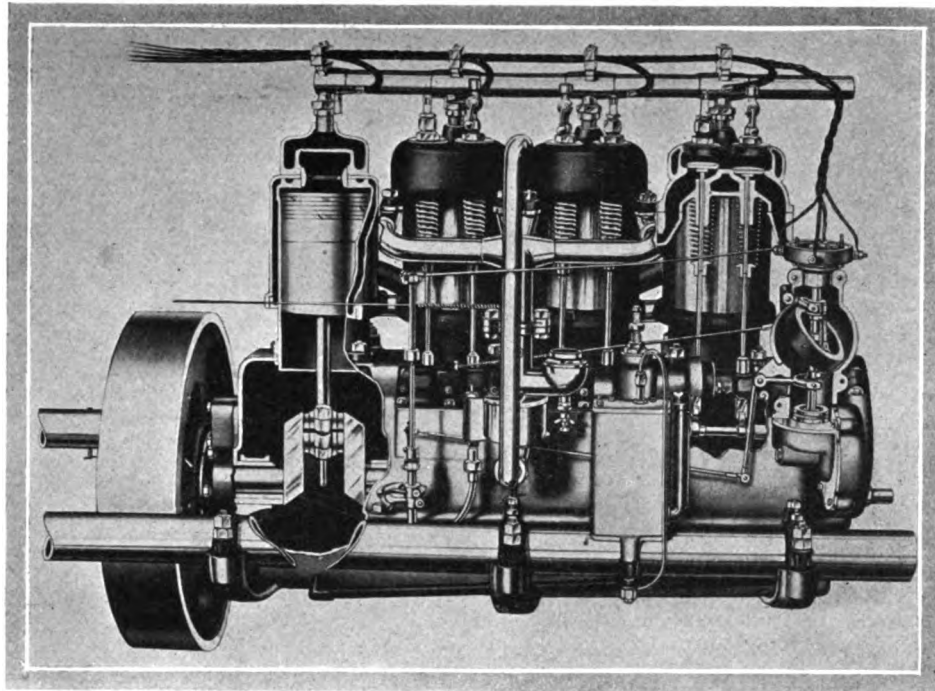
THE STORY OF AN UP-TO-DATE CAR

AFTER several years spent in the manufacture of small, single-cylinder gasoline cars of the runabout and detachable tonneau type, the Cadillac Motor Car Company, of Detroit, brought out, in 1905, a new model, a four-cylinder, 30-horsepower touring

car. The crankpin bearings are of bronze-backed babbitt, and are split. A float feed carburetor of standard make supplies the motor with gas through piping arranged to give the same length of travel for the gas from carburetor to each cylinder. Hot air is taken from a perforated jacket on the exhaust pipe on the left-hand side of the motor. The arrangement of the inlet piping, exhaust piping, the hot-air jacket and other parts are clearly shown in the engravings of the engine.

An interesting feature of the engine is the governor interposed between the throttle lever and the throttle itself. The governor is of the revolving ring type, and hardly needs explanation, being shown clearly in a separate engraving. The tendency of the ring to assume a horizontal position when rotating is utilized to move a linkage connected with the throttle, the throttle opening being reduced at high speeds and increased as speed decreases. The ring is normally held in the position shown in the engraving by a spring whose tension can be regulated by the controlling lever on the steering wheel. If the spring is tightened, the governor will hold the throttle open until a high speed is reached, while if the spring is slackened the throttle will close at low speed; but whatever speed the lever

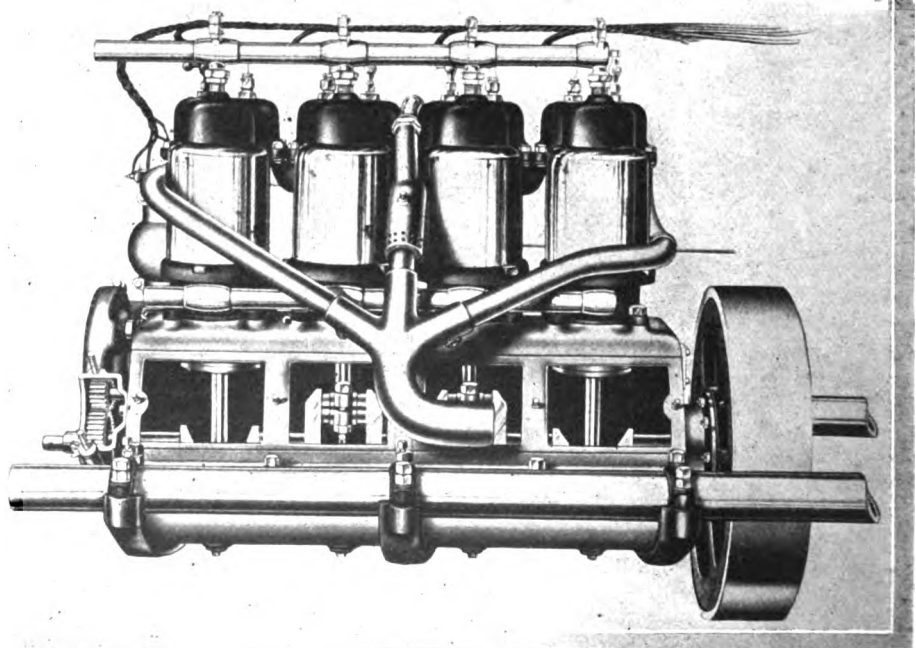
is set for, that speed will be maintained by the governor, as long as the load imposed on the engine is within its capacity to overcome. For instance, the governor will automatically open the



CADILLAC 4-CYLINDER MOTOR, SHOWN PARTLY IN SECTION.

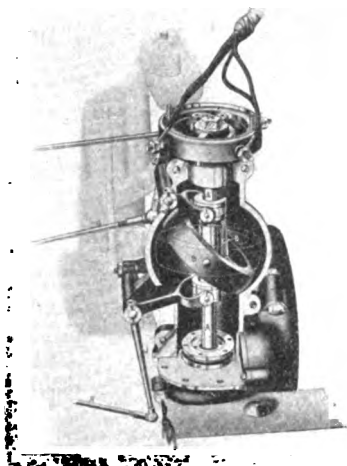
car built on the lines of the foreign type of touring car; and in 1906 the machine remains practically unchanged. Several of the features that characterized the Cadillac small cars are incorporated in the touring car—for instance, copper water jackets on the cylinders, planetary transmission and very long pistons.

The four-cylinder vertical motor not only has individually cast cylinders, but the cylinder heads are also separate castings, so that in case of damage to a cylinder head, for instance, it will not be necessary to purchase an entire new cylinder, pair or set of cylinders, as the case may be. All the valves are mechanically operated and placed in pockets on the right-hand side of the engine; a single camshaft carries the cams that actuate all the valves. Valves can be removed through openings in the tops of the valve chambers or pockets, these openings being closed by screw plugs. Into the inlet valve plugs are screwed the spark plugs; the exhaust valve plugs carry the relief cocks. The cylinders have a bore of 4.3-8 inches and a stroke of 5 inches. Pistons are fitted with three rings each. Connecting rods are of H section and are made from steel drop-forgings. The crankshaft bearings and the



EXHAUST SIDE OF MOTOR WITH CRANKCASE PLATES REMOVED.

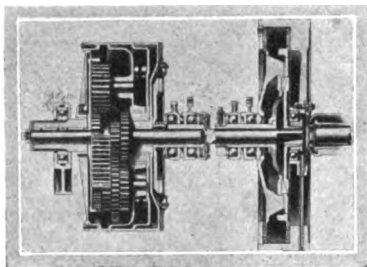
throttle on ascending a grade, and, on the other hand, will automatically cut down the supply of gas when the engine is freed of its load, as when the car is coasting. The governor is mounted on a vertical shaft running in ball bearings, and on the top of the governor shaft is mounted the timer, operated by a lever which can be operated independently of the throttle.



ROTATING RING GOVERNOR.

Drive from the motor is through a leather-faced clutch, three-speed planetary transmission, shaft and bevel gears to the live rear axle. Throughout the clutch, transmission, propeller shaft and rear axle, ball bearings are used, and the road wheels also run on balls. Each wheel runs on two sets of bearings, one larger than the other, the large balls being placed in the line of the spokes so as to take the main stress, and the smaller balls act as a steadying bearing and take care of lateral stresses.

The main clutch, contained in the hollow flywheel, consists of two leather-faced disks normally holding the engine in engagement with the transmission system. The clutch is manipulated in the usual way, by means of a pedal. The planetary transmission is operated by means of bands tightened on the faces of the drums, just as in smaller cars; but there are three forward speeds and one reverse instead of the two speeds provided by most planetary gears, and no internal gears are employed, all being spurs. On the high speed the entire transmission revolves with the shaft, acting as an additional flywheel, and the drive is direct to the bevel gears on the rear axle. In the rear of the transmission is a universal joint connecting with the propeller shaft, and a second joint is placed at the forward end of the short bevel pinion shaft. When the car is normally loaded the propeller shaft is almost exactly in line with the crankshaft, the transmission shaft and the bevel pinion shaft, so that the universal joints are not heavily taxed.

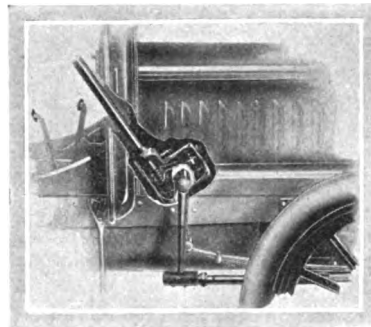


TRANSMISSION AND CLUTCH.

Both front and rear axles are of heavy steel tubing, the front axle being well dropped under the engine. The front springs are semi-elliptic, as in last season's car, but the platform arrangement used in the rear of the 1905 model has been changed for three-quarter elliptics this year. Springs are of good length, and are fitted with clips to prevent breakage under violent rebounds.

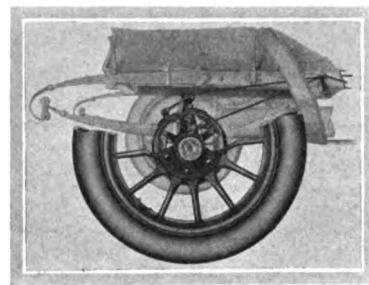
All braking efforts are concentrated in the rear wheels; a single steel drum on each rear hub is acted on by an exterior contracting band, operated by a pedal and constituting the regular service brake, and an internal expanding ring, operated by a side lever and used for emergency braking. By this arrangement no braking stresses are transmitted through the driving mechanism, and the breakage or disablement of the shafts or gears cannot affect the operation of either of the brakes. In applying either of the brakes the clutch is automatically disengaged, the driver thus being relieved of the necessity for making two motions—declutching and braking—at the same time. The clutch can be withdrawn, without applying either of the brakes, which are inclosed.

Wheels are of hickory, with steel hubs; the wheelbase is 102 inches and the tread 56 1-2 inches—standard tread. Tires are 4 inch, and several options are given in this detail.



STEERING GEAR.

The body is of the standard touring type, with side entrances, and the usual straight lines of the rear post are slightly modified so as to form gentle curves, giving the car an attractive appearance. A hollow, pressed-steel dash is used. The standard finish consists of purple lake for the seat panels, doors and other upper parts, striped with carmine, black for the lower part of the body, and a dark carmine for the frame, wheels and axles, which lends a harmonious effect to the whole. In addition to the touring car body, the chassis can be fitted with a runabout or "cross-country" body of the now popular style, or with a coupé body. The specifications of the mechanical equipment are the same in each case. The touring car is stated by the maker to be capable of attaining a maximum speed of fifty miles an hour.

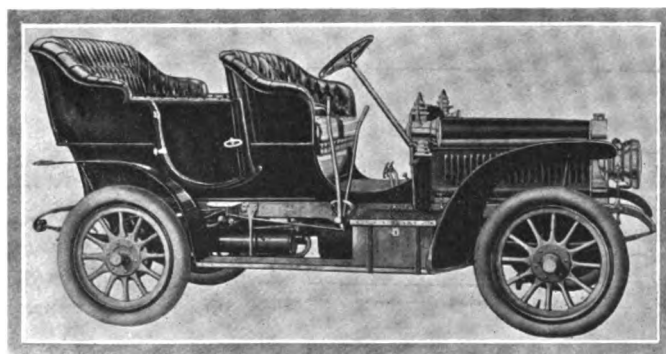


DOUBLE HUB BRAKES

DE LUXE MOTOR COMPANY OF TOLEDO.

TOLEDO, O., May 21.—The De Luxe Motor Company is having plans made for a new factory, which is to be located not far from Toledo or just outside the city limits, and on the Toledo Terminal and Railways Company's belt, which will give it direct connections with every railroad, electric and steam, running into this city. While not prepared at present to give the size of its plant, it will have a capacity to begin with of 250 cars for next year, 500 for the second, and 1,000 for the third. The company had already started work at the old Kirk factory, where it is building its models and patterns, so as to be able to start work immediately when once its new plant is completed, which is expected to be early this fall.

The official roster of the company is as follows: President, G. M. Verity, Middletown, O.; vice-president and secretary, F. M. Keeton, Toledo; treasurer, R. C. Phillips, Middletown; assistant treasurer, F. A. Shepler, Toledo; superintendent, John E. Locher; mechanical engineers, Frank S. Davis and John A. Herzogg. All the Toledo men were, prior to the organization of the new company, employed at the Pope Motor Car Company's plant in this city.



THE COMPLETE CADILLAC 4-CYLINDER CAR.

GASOLINE WON AT CINCINNATI.

CINCINNATI, May 21.—The second annual hill-climbing contest of the Automobile Club of Cincinnati, which was held Saturday, was a bigger success than last year's event. The races were run on Paddock road, in Avondale, a suburb, which graded from 10 to 15 per cent., and the course was three-quarters of a mile. The track was slow, but no fault was attached to the management, and therefore none of last year's records was broken. However, in the free-for-all event O. S. Pogue, with a 24-horsepower Packard, made the distance in 1:01, which was only 2-5 of a second slower than the time established in 1905. The course this year was fifteen feet longer than at the previous race, and that accounts for the difference in the time.

There was not an accident of any kind to mar the occasion. A detail of police kept the course free from pedestrians. More than 5,000 spectators were present and over 400 automobiles lined the sides of Paddock road. Much deserved praise was bestowed on President Val Duttonhofer and Foster Bradley, who were managers of the course. Jos. Monfort was starter, Harry Walters, assistant, and L. S. Colter, A. B. Hyle, J. D. Allison and L. G. Oskamp, judges of the finish. The following is the summary:

Runabouts, from 1 to 12 horsepower—won by A. R. Morgan, 12-h.p. Franklin; time, 1:26; A. G. Brunzman, 32-h.p. Stoddard-Dayton, second; time, 1:30.

Touring cars, 12 to 24 horsepower, with tonneaus attached—won by H. W. Fulton, 20-h.p. Franklin; time, 1:24; Miss Charlotte Allen, 20-h.p. Stevens-Duryea, second; time, 1:29.

Touring cars, 24 to 35 h.p., carrying four passengers—won by F. F. Bradley, 35-h.p. Pope-Toledo; time 1:09; A. G. Brunzman, 35-h.p. Stoddard-Dayton, second; time, 1:18 1-4; H. H. Hoffman, 35-h.p. Pope-Toledo, third; time, 1:20.

Touring cars, 35 to 50 horsepower—won by F. F. Bradley, 35-h.p. Pope-Toledo; time 1:07; Henry Burkhold, 50-h.p. Thomas, second; time, 1:23; J. H. Hughes, 40-h.p. Stearns, third; time, 1:38 4-5.

Free-for-all—won by O. S. Pogue's, 24-h.p. Packard, driven by Chauffeur Fields; time, 1:01; W. O. Balke, 24-h.p. Packard, second; time, 1:02 4-5; Albert Krippendorf, 30-h.p. Pope-Toledo, third; time, 1:05 1-2; F. F. Bradley, 35-h.p. Pope-Toledo, fourth; time, 1:06; H. H. Hoffman, 35-h.p. Pope-Toledo, fifth; time, 1:11; Henry Burkhold, 50-h.p. Thomas, sixth; time, 1:14 1-5; J. H. Hughes, 30-h.p. Stearns, seventh; time, 1:20; Sid Black, 22-h.p. Buick, eighth; time, 1:37.

STEAMER WON MINNEAPOLIS CLIMB.

MINNEAPOLIS, MINN., May 21.—The annual hill climb of the Minneapolis Automobile Club was held Saturday on the Riverside hill driveway. The day was ideal, and thousands of spectators witnessed the events from the side lines or the bluffs, which are so arranged as to enable one to see the entire course.

A new record for the climb was made by H. C. Wilson in his freak steamer, which is rated at only 4 1-2 horsepower. He went up the 2,000 feet of the driveway in the remarkable time of :32 7-8, which is better by 1 1-8 seconds than the record of last year. The little car made the most sensational run of the day, having a hair-raising start and making a sensational finish, and several times being in imminent danger of overturning on the short curves of the road. It won the free-for-all class.

Class 1 was won by Gus Ringlund in his 10-horsepower Cadillac, which went over the course in 1:15 3-4. Second and third were taken by F. M. Overholt in a 14-horsepower Wayne and W. C. Thornhill in his 8-horsepower Reo.

In Class 2 H. J. Mich sent W. H. Wheeler's Buick over the tape in :47, with E. L. Weinant in a Buick a close second, with a record of :48 1-4.

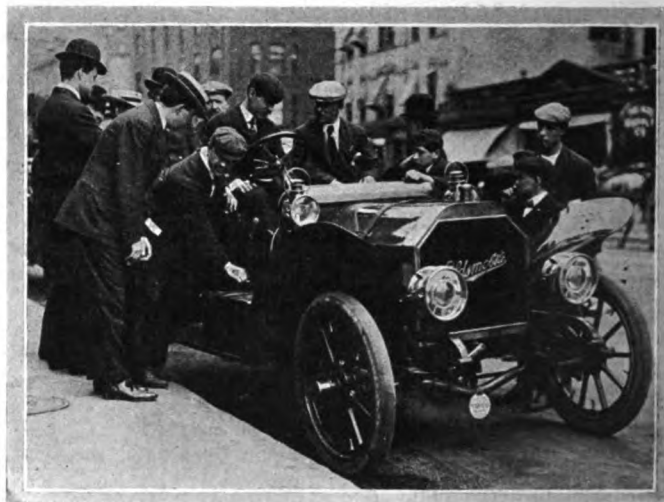
C. C. Evans captured the honors in Class 3, sending his 24-horsepower Mitchell up the hill in :43 1-2. J. J. Barclay, in his Olds, was a dangerous second, coming in just 1-4 of a second later. A Ford, owned by E. J. Phelps, was third, covering the distance in :44 3-4.

Class 4 went to a Pope-Toledo, owned by H. E. Pence, which crossed the tape in :37 3-4. Second and third places were taken by William Knipper in a Thomas Flyer in :38 3-4, and Charles Meyers in a Peerless in :40.

[SEVENTY-SIX MILES ON THE HIGH GEAR.

An interesting test of the ability of a 30-horsepower touring car to make a trip of 76 miles over roads varying from very good to very bad, and from level to 17 per cent. up-grade, entirely on the high gear, was made on Saturday last, when an Oldsmobile Model S touring car started from the Oldsmobile agency at 1655 Broadway, New York, and with the control lever sealed in the high gear position, made the trip to Poughkeepsie without an involuntary stop.

At the start Joseph Tracy was at the wheel, and he drove to Yonkers, at an average speed of 14 miles an hour. Here Tracy turned the wheel over to Ernest Keeler (who, by the way, is slated to drive the Oldsmobile Vanderbilt Cup racer), and Keeler finished the run. The first real test of the motor came when the long and sandy hill south of Croton was encountered. Making a rush at the grade, the car went up in good style; but near the top a truck was found occupying the middle of the road. Rather than stop and spoil the run, Keeler turned into the ditch and managed to get around safely, though the car narrowly escaped upsetting. Welcher Hill, north of Croton, with a maximum grade of about 17 per cent., had to be taken without a flying start, owing to the



JOSEPH TRACY READY FOR THE OFFICIAL START.

high "thank-you-ma'ams" and the number of vehicles in the road. The surface was poor, too, having been covered with loose dirt in the process of road improvement. The top was reached, however, and the remaining hills on the route proved to be comparatively easy. A stop was made at Peekskill for gasoline and water, and the run finished without special incident. The seal was left intact until the following morning, when it was broken by H. N. Bain, proprietor of the Nelson House at Poughkeepsie, under the direction of officials of the New York Motor Club.

NORTH JERSEY A. C. MEET, JUNE 9.

PATERSON, N. J., May 23.—The North Jersey Automobile Club, which is the largest organization of its kind in New Jersey affiliated with the A. A. A., will hold its second annual race meet on the driving park track at Hohokus, N. J., Saturday afternoon, June 9. The track is a half mile with banked turns, and is kept in excellent condition. It is believed that it will be possible to equal if not break some of the established half-mile track records.

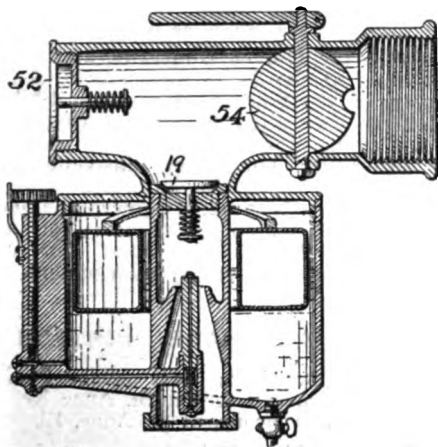
The race committee has outlined a number of interesting events, the prizes for which will be silver cups for first and second places. Entry blanks may be secured from Robert Beattie, secretary of the club, Little Falls, N. J.

Patents

Carbureter.

No. 817,941.—C. Stute, of Newark, N. J.

This is a float-feed carbureter whose special feature is the employment of automatic valves for the purpose of preventing back-firing into the spray chamber. The entire carbureted mixture passes through the light



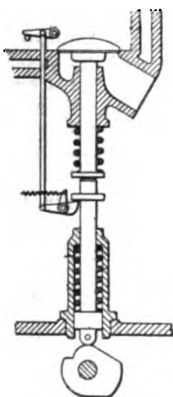
STUTE'S AUTOMATIC CARBURETER.

automatic valve 19 before passing to the throttle valve 54. The relief valve 52 is provided to open outward in case of a back-fire in the mixture pipe, and valve 19 is supposed to close before the flame can get through it.

Combined Valve and Spark Cam.

No. 819,116.—H. Austin, of Birmingham, England.

A combination toe and snap cam for operating a valve (inlet or exhaust) and a



AUSTIN'S IGNITION AND VALVE GEAR.

make-and-break igniter. The igniter is worked by a hammer-blow mechanism from the push rod, and the valve movement is not affected thereby.

Shock Absorber.

Nos. 818,646 and 818,647.—R. P. Winsor, of Providence, R. I.

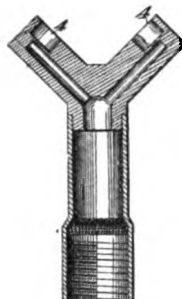
Two forms of frictional shock absorbing devices, arranged to work freely under

small vibrations and to come into play frictionally when the vibrations are considerable.

Acetylene Gas-Burner.

No. 817,750.—J. B. Carroll, of Chicago, Ill.

A form of burner having the tips deeply recessed, so that the substance of the tip is



CARROLL'S ACETYLENE BURNER.

at a considerable distance from the flame, except at the orifice from which the gas issues. At this point the material is so thin that it becomes heated beyond the temperature which would permit deposits of carbon from the flame. The cold air necessary for combustion enters around the sides of the orifices 4 4, thereby assisting to keep the walls of the orifice cool.

Solid Tires.

No. 817,957.—W. Christy, of Akron, Ohio.

A solid tire held by wire retaining rings at its sides and having its base stiffened by the incorporation of a strip of wire cloth or the like extending from side to side of the rim channel.

Transmission Gear.

No. 819,334.—A. T. Brown, of Syracuse, N. Y.

The design shown in the drawing herewith. The case is not split in the plane of the shafts, but higher up, and the shafts, which run in roller or ball bearings, are inserted by making the hubs of the case

large, and—for the jackshaft—closing them by threaded caps which leave a large opening when removed. The pinion 34 is large enough to slip through that opening, for convenience in assembling. The driving shaft 14 is riveted into the long hub 23 of the driving pinion 21, which, for the high speed, couples direct to the sliding pair of gears 26, 27. The shaft 14 extends nearly through the square shaft 16, supporting the latter very steadily, and oil holes are drilled all along 16.

Machine for Making Radiator Tubes.

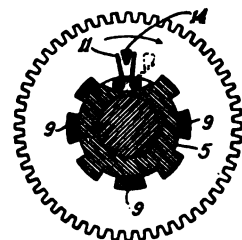
No. 817,939.—F. H. Stolp and C. Wright, of Chicago, Ill.

A machine for applying a continuous spiral crimped flange to a radiator tube in the manner described in patent No. 817,938.

Non-Grinding Sliding Gears.

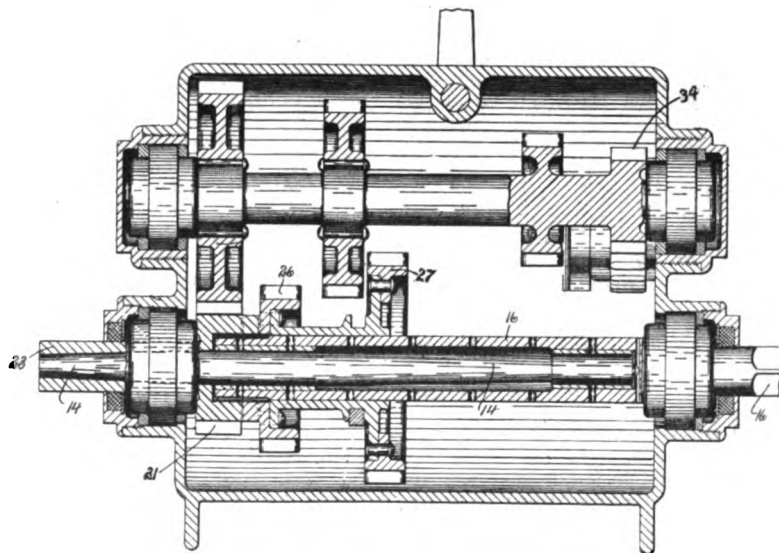
No. 818,161.—D. S. Grant, of Stoneham, Mass.

In this invention the slidable gears 1 2 are sleeved on a carriage 5, and the power is transmitted from the gears to the carriage



GRANT'S NON-GRINDING GEAR.

through lugs 9 9 at the sides of the gears. A pair of springs 11 engage a lug 14 projecting from each of these gears, and these springs tend to hold the gears in the position shown; consequently the gears can rotate a sufficient distance on the carriage before the driving lugs come together, to permit the teeth to go into mesh without grinding.



BROWN'S SLIDING-GEAR TRANSMISSION AND ITS CASE.

NEWS AND TRADE MISCELLANY.

The Novelty Tufting Machine Company has removed from 192 to 264 Michigan avenue, Chicago, two blocks south of the Auditorium Hotel.

The George J. Scott Motor Company, New York agents for the Glide, has removed from 308 West Fifty-ninth street to 1720-1722 Broadway, near Fifty-fourth street.

The North Western Storage Battery Company, formerly of 286 East Madison street, Chicago, Ill., has moved into larger and more convenient quarters in Milwaukee, at 488 Milwaukee street.

Morgan & Wright's San Francisco branch has been practically restocked and reopened at a new permanent address, 411-413 Golden Gate avenue, and is in position to again take care of Pacific Coast customers.

The Atlantic City Automobile Company, which owns a fine garage in that city, has ordered signs erected every mile along the roads leading from Philadelphia and Lakewood to Atlantic City. Special signs have been ordered for every cross road.

The Autocar Company of New York has arranged to occupy its new quarters at 138 West Thirty-eighth street, on June 1, when the Reo Motor Car Company, which now occupies the premises, will remove to its new store and garage at 40 West Sixtieth street.

Edward Russell Thomas, of New York, has received from Europe his new 120-horsepower Mercedes, that has a speed possibility of 90 miles per hour. The car was ordered four months ago through Smith & Mabley, Inc., and was delivered to Mr. Thomas by the Mercedes Import Company.

C. A. Duerr & Co., New York agents for the Royal Tourist car, have purchased the lease and plant of the Metropolitan Auto Company, at 2182 Broadway, where the Royal headquarters will shortly be established. The present premises of the Royal agency at Broadway and Fifty-eighth street have been outgrown.

Marking the commencement of an extensive outdoor advertising campaign, the Maxwell-Briscoe Motor Car Co., of Tarrytown, N. Y., has placed thirty large cut-out signboards along the line of the Pennsylvania Railroad between New York and Philadelphia, and forty along the same railroad between Washington and the Susquehanna River.

German firms are unable to fill all foreign orders for automobiles. Vice-Consul Schlemmer of Mannheim writes that the German motor production for 1905 was \$10,000,000, the export to England and France increasing 400 per cent. Twice the present possible production in Germany would not supply the demand, especially for heavy vehicles.

E. V. Hartford, president of the Hartford Suspension Company, has opened a new salesroom for Gobron-Brillie cars and a place for applying Hartford suspensions, at Broadway and Eighty-eighth street. Harry H. Chipps has been installed as general manager. There is storage accommodation for about fifteen cars, that will be given the same attention they would receive in a private garage.

At the last meeting of the New York Automobile Trade Association the following concerns were elected to active membership: Maxwell-Briscoe Motor Company, Matheson Company of New York, Lozier Motor Company, Hartford Suspension Company, Wayne Automobile Company of New

York, Frayer-Miller Motor Car Company and Covell & Crosby Company.

Fire Chief Edward Croker, of New York City, has had a set of Truffault-Hartford shock absorbers put on his American Mercedes car, which he uses in going to fires. Shock absorbers were also put on the Locomobile of Deputy Fire Chief Thomas Lally a couple of weeks ago, and have given great satisfaction. Both cars are required to go over all obstructions on the city streets at great speed.

Henry Ford, of the Ford Motor Company, offers this explanation of the self-starting tendency of the new six-cylinder Ford car: "The cranks being set at 120 degrees instead of at 180 degrees as in a four-cylinder motor, the ability of a six-cylinder motor to start on the spark is not dependent on its liability of stopping exactly between compressions. At all times, in the newer type of motor, one piston is in the proper position to receive its impulse, so that it is only necessary to have the spark advance lever in the 'slow' position and close the switch. If there is a charge of explosive mixture in the cylinders, the motor will invariably start."

Owners of automobiles give more attention to the matter of perfect ignition than they used to. Time was when the question of ignition was not considered of important moment, but everyone nowadays recognizes the necessity of high-class appurtenances in the ignition outfit. The Dayton Electrical Mfg. Co. is one of the pioneers in manufacture of ignition systems, its well-known Apple magnetos having achieved a great reputation at home and abroad. Recent advices from the factory at Dayton bring out the fact that, owing to the tremendous demand for the new Apple storage battery and battery charging outfit, the business is fully three times as large as it was at this time one year ago. The company has recently been compelled to double the factory floor space, although the plant was by no means small. A new shipping department has been installed, a new office built for the superintendent, and the force of regular employees greatly increased.

NEW AGENCIES ESTABLISHED.

The North Philadelphia Auto Station, of Philadelphia, has secured the local agency for the 40-horsepower Relay car.

The Auto Tire Company, of Kansas City, Mo., has completed arrangements for handling Morgan & Wright tires and accessories in that vicinity.

The Shawmut Motor Company, of Boston, has established a New York salesroom at 1634 Broadway, with Geo. T. Gould as manager.

The Central Automobile Company, of Pittsburgh, Pa., has been appointed local distributor for the Moon, a 40-horsepower, four-cylinder car made in St. Louis.

The Grant Square Garage, 1378-1382 Bedford avenue, Brooklyn, has taken the Greater New York agency for the Moon car, made by the Moon Motor Car Company, of St. Louis.

The Franco-American Auto and Supply Company has opened up at 1404 Michigan avenue, Chicago, and is carrying a full line of accessories and supplies, including the famous Lacoste ignition specialties imported by Leon Rubay, New York. C. C. Boynton is

secretary and general manager of the company.

The new Colonial Automobile Company, of Pittsburgh, Pa., has taken the agency of the Finch car, made by the Pungs-Finch Automobile Company, of Detroit. It is a water-cooled, four-cylinder touring car of two types, 32 and 22 horsepower.

Waldon W. Shaw has been appointed Chicago agent for the American Locomotive Company, at 1532 Michigan avenue. This is the only important agency that is not strictly run by the factory. B. C. Buxton, formerly with the Hamilton Automobile Company, will be associated with Mr. Shaw as manager.

With the Dorris, Duquesne, and Gale to draw to, the South Broad Auto Company, of 729 South Broad street, Philadelphia, has filled up by securing the local agency for the Duryea car, built at Reading, Pa. The comprehensiveness of this energetic company's combined line is such that the present showrooms and garage are inadequate to carry on its business, and architects are at work on plans for a considerable enlargement of its facilities.

PERSONAL TRADE MENTION.

A. W. Edwards has been appointed general sales manager for the St. Anne Kerosene Motor Company, of St. Anne, Ill.

S. D. Waldron, sales manager of the Packard Motor Car Company, of Detroit, was a trade visitor to Philadelphia last week.

The South Broad Automobile Company, of Philadelphia, which handles the Gale, Duquesne, Duryea, and Dorris cars, has secured L. M. McComb as manager.

Wayne Davis, an official of the Keystone Motor Car Company, of Philadelphia, will make a three weeks' tour of England, France, and Switzerland, leaving New York on the *Deutschland*, May 31.

The Keystone Motor Car Company, of Philadelphia, recently added to its corps of salesmen C. J. Trumbull, formerly of the Packard Motor Car Company, of Detroit. The Keystone concern handles the Packard in Philadelphia.

C. W. Frank has succeeded A. J. Crittenden as manager of the Washington Electric Vehicle Transportation Company, agents in Washington, D. C., of the Columbia gasoline and electric cars. Mr. Frank comes from San Francisco, where he was manager of the Pope branch prior to the earthquake.

Charles T. Allen, for many years connected with the pump industries of Battle Creek, has disposed of his holdings in the Union Steam Pump Company. Mr. Allen is recovering from a severe illness and will take a long rest. Catalogues and samples will reach him at 265 Maple street, Battle Creek, Mich.

George W. Dunham, who has succeeded H. E. Coffin as chief engineer of the Olds Motor Works, was in New York last week on business in reference to the Oldsmobile racer entered for the Vanderbilt cup. Mr. Dunham, who takes the place vacated by Mr. Coffin, has been the assistant of the latter for two years and the practical shop man of the engineering force. He is the designer of the two-cycle Olds model and has had charge of the practical work on the racer ever since the designs for it were completed and accepted. Mr. Dunham says that the designs for the 1907 models are already well in hand, and that they will be out early in the fall. He is a college-bred engineer, with six years of practical experience.

THE AUTOMOBILE

VOL. XIV.

NEW YORK—THURSDAY, MAY 31, 1906—CHICAGO

No. 22

NEW YORK CITY HAS AN OPEN-AIR SHOW

New York City had its first open-air show—and it was the first in this country—at the Empire City track, May 24, 25 and 26. While the effort of the New York Automobile Trade Association was not the great success which some of its promoters anticipated, it certainly was not the failure which others predicted. A substantial profit was accumulated, and sales were numerous enough to encourage the belief that an open-air exhibition at another time could be developed into a big affair, providing it had the support of the manufacturers themselves.

With no building large enough to supply plenty of exhibiting room for the entire industry, it is plainly apparent that if shows are to continue the principal one of the future must needs be held outside the confines of an erected structure.

The big tent held a varied line of exhibits, and many availed themselves of the opportunity of inspecting the goodly array of 1906 models, many of course having already had an earlier look at the winter shows. The accessories concerns were not exactly happy under the grandstand, and consider on the next occasion that they, too, should also have a tent.



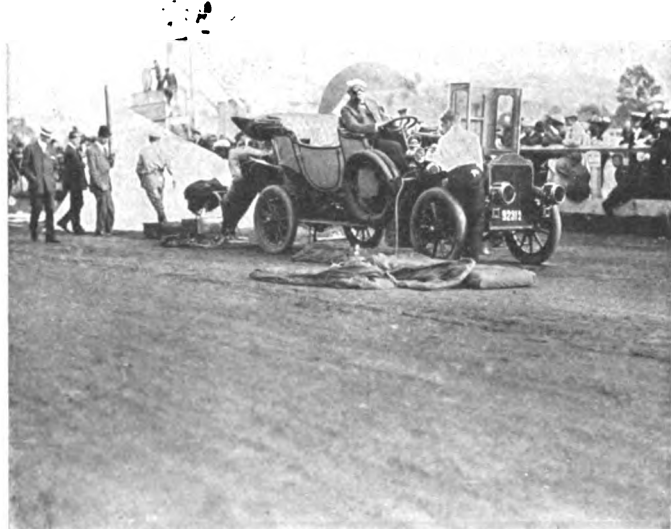
THE BIG TENT AT THE EMPIRE CITY TRACK OPEN-AIR SHOW WHEREIN THE VEHICLE EXHIBITS WERE DISPLAYED.



A GOBRON-BRILLIE PLOUGHING THROUGH THE SAND.



L. R. SMITH IN MAXWELL WINNING OBSTACLE RACE.



EZRA FITCH, WHOSE WHITE CARRIED CAMPING OUTFIT.

Chairman W. M. Harradon and Frank Eveland, C. Andrade, Jr., Percy Owen, and Secretary Reeves worked hard to obtain satisfactory results.

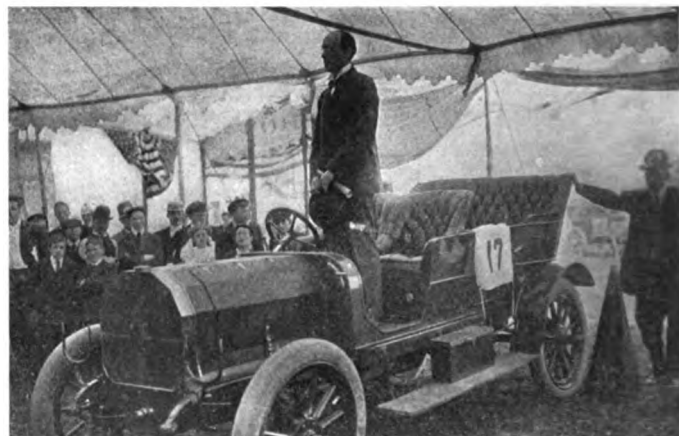
An autumn show is talked of, when the 1907 models will be available, but the question may arise as to what attitude the N. A. A. M. might take in the premises. Whether it would permit a local open-air show in New York City in view of the fact that it had objected to a similar event in Buffalo is a proposition that would come before its executive committee.

President Morris Opened the Show.

Perfect weather and appreciative, if not numerous, spectators, marked Thursday, the opening day. In the grassy oval within the track was pitched the enormous tent, under which the exhibits of complete automobiles were installed; twenty-four makers had taken all the space marked off for exhibitors. Under the grandstand were the booths of the exhibitors of accessories. The mile track was used for practical demonstrations of the machines, and also for races and other contests designed to bring out the power, braking qualities, economy, steadiness, and other points in the contestants.

Early in the afternoon Dave Hennen Morris, president of the Automobile Club of America, mounted an automobile and, after a short address, declared the show open.

"The idea of this open-air show is an excellent one," said Mr. Morris. "The exhibition supplies a long-felt want, and



PRESIDENT DAVE H. MORRIS, A. C. A., OPENS THE SHOW.

I hope every visitor will make each exhibitor take him on the track and prove everything he claims for his car. I am satisfied at the recognition of our club in this trade gathering. We have always done our best to encourage the sport and the industry, and I believe there should always exist co-operation between the trade and the clubs. I declare this show open."

Interest was about equally divided between the track events, the restaurant in the clubhouse, and the inflation of the hot-air balloon, which, by the way, had just enough energy to carry it over the roof of the grandstand, the two aeronauts who were to have made a thrilling parachute drop falling ingloriously into the paddock.

Following is the summary of the track events:

FLEXIBILITY TEST.

For 4-passenger gasoline cars; 1 mile speed trial and 1-4 mile slow speed trial on high gear, flying starts.

- | | |
|---|------------|
| 1. Aerocar, 24 h.p.; driver, Percy Owen, driver | 700 points |
| 2. Welch, 50 h.p.; driver, Burgoyne Hamilton | 534 points |
| 3. Northern, 20 h.p.; driver, Peter Fogarty | 510 points |
| 4. Bayard Clement, 24 h.p.; driver, S. Bowman | 508 points |

BRAKE TESTS.

For cars claiming 40 miles an hour or more. Cars to cover 1-9 mile in 11 2-5 seconds or less and apply brakes on signal.

- | |
|--|
| 1. Oldsmobile, 30 h.p.; driver, Ernest Keeler; time, 10 sec.; stopped in 168 feet. |
| 2. Marmon, 20 h.p.; driver, T. E. Schultz; time, 10 sec.; stopped in 168 feet. |

BRAKE TEST.

For cars claiming 30 miles an hour or more. Cars to cover 1-8 mile in 19 seconds or less and apply brakes on signal.

1. Cadillac, 10 h.p.; driver, W. C. Martin; time, 18 1-5 sec.; stopped in 66 feet.
2. Northern, 20 h.p.; driver, Peter Fogarty; time, 16 3-5 sec.; stopped in 88 feet.

ONE-MILE MATCH RACE.

1. Franklin, 12 h.p.; driver, E. Easter 1:45
2. Frayer-Miller, 34 h.p.; driver, P. Fisher

Friday Had an Economy Test.

Friday's interesting feature was the economy test, in which each of the competitors was provided with one pint of gasoline, and prizes were awarded for the greatest distance traveled per horsepower hour. The event was won by Walter C. Martin, driving a 10-horsepower single-cylinder Cadillac, who fell barely short of five miles in his performance. Figured out on the basis of the recent two-gallon efficiency contest, 5 miles on a pint of gasoline is equal to 80 miles on two gallons of the same fuel. The officials used the formula that ten cubic inches of piston displacement equals one horsepower, therefore the winning car covered 2,681 feet per pint of gasoline per horsepower per hour.

The sand pit test proved an easy task for the majority of the cars entered. A 75-foot stretch of sand was provided with sand one inch deep at the start, gradually increasing to a depth of two feet at the finish. Start was made five feet from the entrance. E. B. Blakeley drove his 30-35-horsepower Ardsley through in 9 seconds, and G. L. Lighthall, in a 36-horsepower Welch, went through in 9 2-5 seconds. These were the only cars to get through inside the 10-second mark.



AN EXHIBIT THAT WAS TASTEFULLY DRESSED.

The track at all times, when not in use for the contests, was crowded with demonstrating parties, who oftentimes indulged in impromptu brushes. Summary:

EFFICIENCY TEST.

Prize for greatest distance traveled per horsepower hour on one pint of gasoline from reservoir furnished by committee.

1. Cadillac, 9.8 h.p.; driver, Walter C. Martin; distance, 26,275 feet; 2,681 feet per pint per horsepower hour.
2. Aerocar, 20.09 h. p., driver, Percy Owen; distance, 15,935 feet; 793 feet per pint per horsepower hour.
3. Frayer-Miller, 26.4 h.p.; driver, Frank Lawwell; distance, 16,225 feet; 614 feet per pint per horsepower hour.
4. Northern, 24.9 h.p.; driver, Peter Fogarty; distance, 10,920 feet; 438 feet per pint per horsepower hour.

POWER TEST.

Prize awarded for best time made through prepared stretch of deep sand, 75 feet in length. Open to all classes of power.

1. Ardsley, 30-35 h.p.; owner and driver, E. B. Blakeley... :09
2. Welch, 36 h.p.; owner and driver, G. L. Lighthall..... :09 2-5

REVERSE GEAR 75-YARD DASH.

Open to all planetary transmission cars.

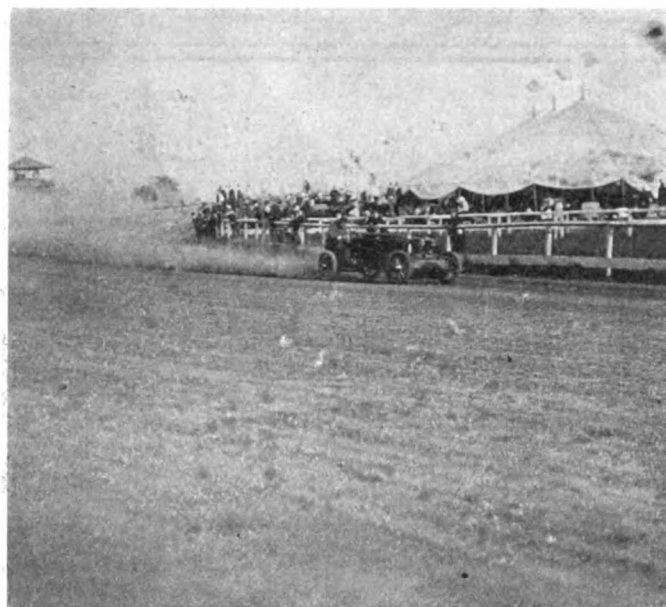
1. Welch, 50 h.p.; driver, Hamilton :12 4-5
2. Northern, 20 h.p.; driver, Peter Fogarty :21 4-5

Closing Day of the Show.

Well attended was the third and closing day of the show, the unmistakable feature of which was Walter Christie's exhibition mile in 53 seconds, a duplication of Barney Oldfield's Peerless Green Dragon figures. Christie took two flings at the mark, his first dust-whirling circuit being :54 1-5, when he knew that the "Blue Streak" could easily equal the world's record and perhaps lower it. The soft condition of the track surface made the going a little uncertain, and rounding the



GENERAL VIEW UNDERNEATH THE BIG TENT.



WALTER CHRISTIE DOING HIS RECORD MILE.



WHERE THE BALLOON DESCENDED THURSDAY.

turns the driver shut off power, once skidding dangerously close to the fence. Christie again intends to try for a place on the American team for the Vanderbilt race.

Ernest Keeler was the Oldsmobile winner of the vibration test, spilling only three-eighths of an inch of water in the 200-yards spring from a standing start. M. J. Wolfe, with an Autocar, most successfully pulled 500 pounds of dead weight 200 yards. Louis R. Smith excelled with a Maxwell in the runabout division of the obstacle event and A. L. Kull, with a Wayne, was successful in the touring-car class. Ezra Fitch was an easy winner as the best-equipped touring car for a thirty-day trip, his White steamer carrying a complete camping outfit. The balloon ascension was so long delayed that the crowd didn't wait to see if it took place. Summary:

VIBRATION TEST.

Cars to go 200 yards from standing start on high gear, carrying pail filled with water.

1. Oldsmobile, 28 h.p.; driven by Ernest Keeler. Loss, 3-8 inch.
2. Gobron-Brillie, 35 h.p.; driven by E. Hansch. Loss, 3-4 inch.
3. Wayne, 50 h.p.; driven by A. L. Kull. Loss, 6 1-4 inches.

TRACTION TEST.

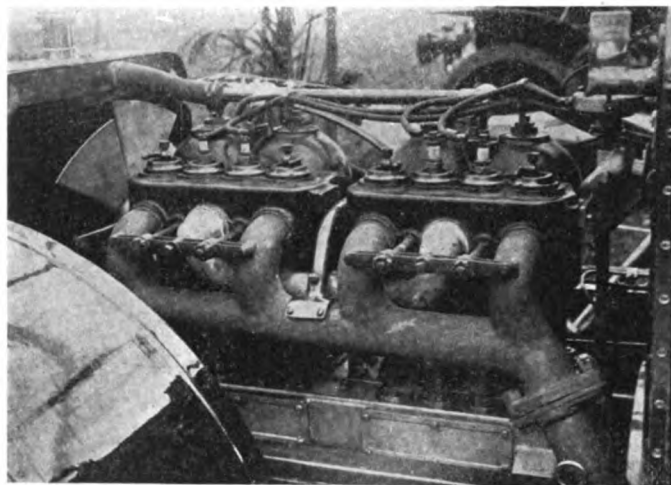
Hauling 500 lbs. dead load 200 yards.

1. Autocar, 24 h.p.; driven by A. H. Whiting..... :25 2-5
2. Frayer-Miller, 24 h.p.; driven by F. Lawwell..... :28 4-5
3. White Steamer; driven by J. Bell..... :44 4-5

OBSTACLE RACE.

1. Maxwell, 10 h.p.; driven by Louis Smith..... :16
2. Wayne, 50 h.p.; driven by A. L. Kull..... :16 1-5
3. Autocar, 24 h.p.; driven by M. J. Wolfe..... :16 3-5

One-mile record trial by Walter Christie, driving the 100-h.p. Christie front-drive racer. Time, 53 seconds.



SIDE VIEW 35-40-HORSEPOWER MOTOR OF THE AMERICAN.

THE ENGINE OF THE AMERICAN.

There is an attractive dash of foreign style in the general appearance of the 35-40-horsepower touring car manufactured by the American Motor Car Co., of Indianapolis, Ind., and exhibited at the open-air show. The bonnet has a flat top and the body lines are long and straight, giving the car a decidedly rakish look. The four-cylinder vertical motor has its cylinders cast in pairs; the bore is 4.9-16 inches and the stroke 5 inches. All the valves are mechanically operated and, all being placed on the same side of the engine, are operated by a single camshaft. The engine can be accelerated to a maximum speed of nearly 1,500 revolutions a minute. A sub-frame attached to the pressed steel main framing carries the engine and the sliding gear transmission. The clutch is a leather-faced cone working into the flywheel; the leather facing is backed by springs to give smooth starting and avoid jerks and jumping of the car when getting under way. Drive is by propeller shaft and bevel gears, the propeller shaft being fitted with two universal joints and running in ball bearings; claw clutches on the outer ends of the live rear axles engage with counterpart clutches in the hubs of the rear wheels. The front axle is of I-beam steel. Springs are semi-elliptic all round.

The regular service brakes are expanding rings on the rear hubs, while the emergency brake is a constricting band on a drum carried on the propeller shaft.

A RUNABOUT AT POPULAR FIGURES.

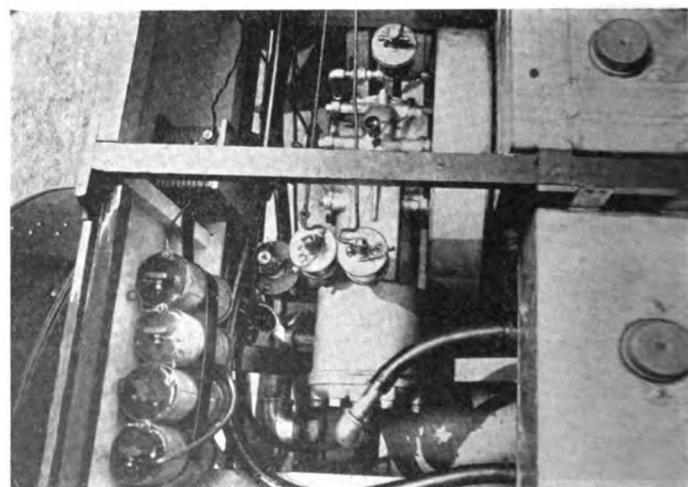
From time to time there are placed on the market automobiles designed with a view to filling the persistent "long-felt want" for a reliable snail machine at a low price, as automobile prices go. One of the latest in this field is the Jewell \$400 runabout, manufactured by the Forest City Motor Car Co., of Massillon, Ohio.



THE NEW JEWELL MODEL B RUNABOUT.

and exhibited for the first time at the Empire City track open-air show by the Covell & Crosby Co., New York, Eastern agents.

The Jewell car follows, in a general way, the lines of the well-known buggy, having a piano-box body with straight dash and comparatively large wheels. The motor has a single cylinder of 4½ inches bore and 4 inches stroke, and is of the two-cycle type, the piston receiving an impulse at every revolution of the shaft. The motor is rated at 8 horsepower and is hung near the rear axle with the cylinder head pointing backward. On an extension of the crankshaft is mounted a two-speed and reverse planetary transmission which drives to a countershaft hung below the engine and carrying the differential gear. Final drive is by side chains the rear wheels, revolving on a dead axle of I-beam section steel. The front axle is also of I-beam steel. The engine is water-cooled, the tubular radiator being suspended back of the front axle. The frame is of rolled steel in a single piece, and to it the engine and other parts are attached by means of steel brack-



TOP VIEW OF MOTOR OF JEWELL RUNABOUT.

ets riveted in place. The spring suspension is on the three-point principle, there being two full elliptic springs in the rear and two inverted semi-elliptic springs disposed crosswise in front. Wheels are of wood, 32 inches in diameter, fitted with cushion tires. The wheelbase is 60 inches, the tread 46 inches, and the weight 700 pounds.

WHAT DEAD HORSE HILL CLIMB SHOWED

By A. G. BATCHELDER.

WORCESTER, MASS., May 25.—Emphasizing in pronounced manner the great strides in automobile advancement, was the deduction which the practical man would make from a study of the score-sheet of the second annual climb of Dead Horse Hill. Once this grade would have tested severely the capabilities of the motor-driven vehicles; now the ascent is a jest for the lowest-powered car sold.

Spectacular indeed was the ascent of the Vanderbilt Darracq, but to the seeker of a staunch touring automobile the performances of the stock cars supplied more interesting material. Up they rushed—of 10, 20, 30, 40, 50, and 60 horsepower—and not a one faltered except a single luckless vehicle that veered into a gully alongside the road. Of course, some did the upward journey faster than others, but all met the task and the sum total told of the marvelous progress of a gigantic industry.

In point of speed the honors went to the same owner and the same driver as on the occasion of the first climb, managed so perfectly under the direction of Asa Goddard, now a Cleveland. And right here it might be remarked that President John Coghlin of the Worcester Automobile Club directed affairs in the same vigorous vein as his predecessor, Chester Campbell assisting in the accumulation of an overflowing entry.

A year ago it was S. B. Stevens' Mercedes with Campbell at the wheel that excelled all others, its skyward mile being in 1:09. This time Mr. Stevens contributed the Darracq which won the Vanderbilt Cup, and it did the trick again in the free-for-all, the figures being 1:02. A heavy rainstorm late Thursday afternoon prevented the completion of the odds and ends of the too-long program, and Referee Speare gave opportunity the following

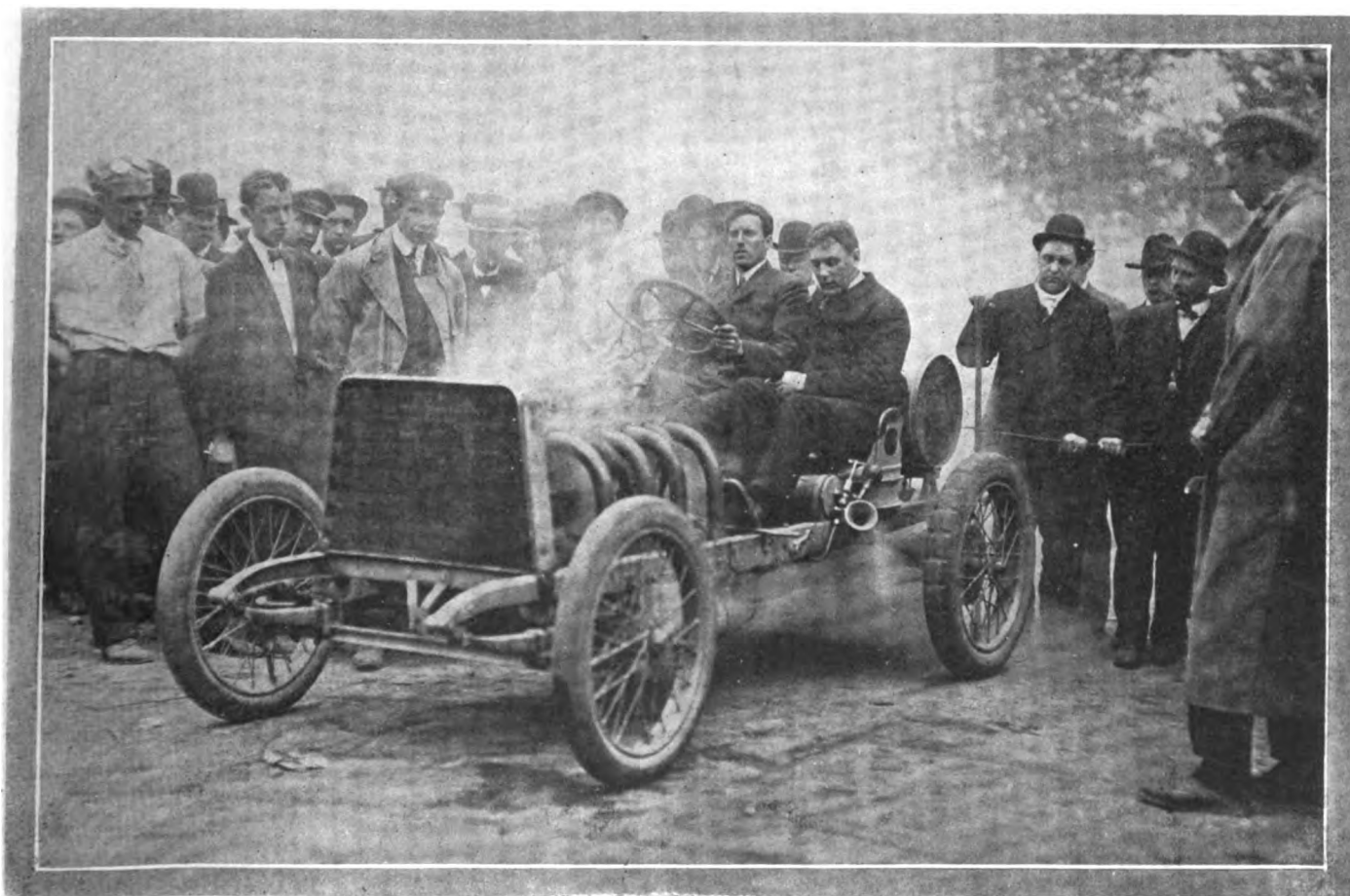
morning for the wind-up. Campbell sent the noisy craft upward in 1:01 2-5, and, after the regular events were concluded, in a time trial bounded the mile in 59 seconds.

But much of the substantial glory of the climb fell to the Stevens-Duryea "Big Sixes." One ascended in the "\$3,000 to \$5,000 class" in 1:14 3-5, thereby taking first place, and then another climbed in 1:10 in the heavyweight class, again a winner. This same car minus its tonneau later was clocked in 1:09 2-5, which meant second prize in the free-for-all.

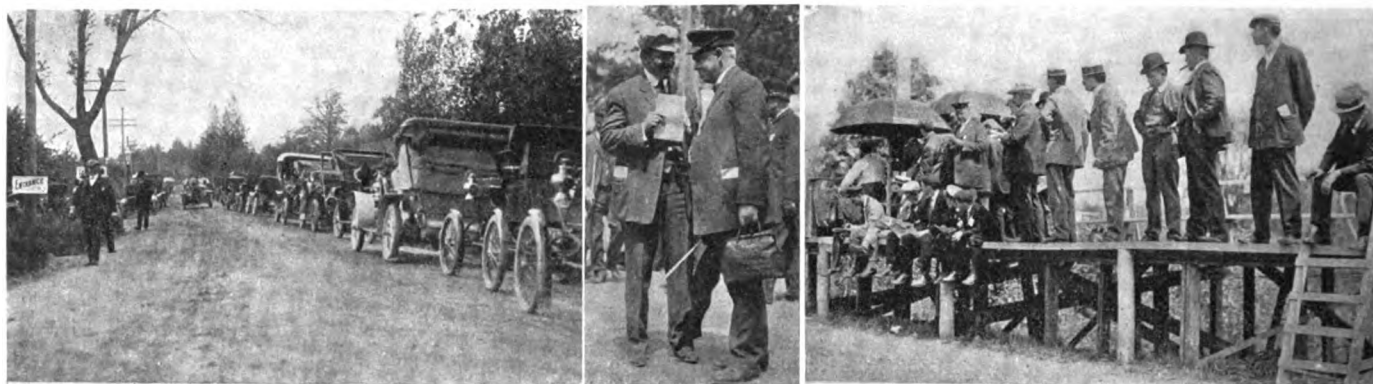
Harding, pilot of the English Daimler which had triumphed over the Stevens-Duryea at Wilkes-Barre, had to assent to second honors in the heavyweight class, 2 seconds behind the "Big 6." Hilliard and the Napier that won last year's Mount Washington contest was a disappointed third in 1:14. The Darracq was a failure in this event, possibly because Campbell was anxious to reach too quickly his third and highest speed. He had a hit-and-miss ride in 1:34, which tells its own story.

The steamers had their innings in the middleweight class, in which L. F. N. Baldwin guided one to the summit in 1:06 4-5, the second place going to another Stanley driven by H. Ernest Rogers. Neither of these participated in the free-for-all.

Fred Marriott, the steam king of the Ormond-Daytona meet, on the day previous to the climb was credited with a fast effort in the Stanley car said to have been constructed for the Vanderbilt Cup race, though no entry for it has been filed yet. Marriott had some difficulty in keeping the car on the road—which has a perceptible crown—and his withdrawal from the events was reported to have been due to fear of running into the crowd. Since thousands of spectators did overrun the hill in a hazardous way, Marriott prob-



CAMPBELL AND THE VANDERBILT DARRACQ WHICH TOOK THE DEAD HORSE HILL HIGH-SPEED HONORS.



ROADS ABOUT WERE LINED WITH CARS.

CAMPBELL AND COGHILIN. REFEREE SPEARE STUDIES THE PUZZLING PROGRAM.

ably exercised excellent judgment in not accepting the risk involved.

Three women were prominent in the proceedings, Mrs. H. Ernest Rogers, of Newton, particularly so through three times winning in her 10-horsepower Maxwell. Mme. Ella Des Roches drove her Franklin in one event, and Mrs. E. L. Oppenheimer rode in her Reo when it scored a winner. An injury prevented her from being at the wheel, as she had originally intended. Several women contented themselves with being passengers in the competing cars.

With many varied events on the card there were, of course,

Exactly how to police an automobile road contest except with a regiment or two of soldiers is a puzzle, for the onlookers will insist upon spreading all over the highway. One driver, in commenting on the incaution of the observers, said:

"I see people all over the road. I hope they will get out of the way in time. If they do not, well, I must run them down, for there are many more spectators who stand alongside the course and deserve the safety which they are entitled to by not going on the road as the others have done."

A roped road is one answer, but when the returns from a free race are confined to entry fees and program, the necessary ex-



NOW AND THEN THE SPECTATORS TOOK POSSESSION.



THE HIGH BANKS SERVED FOR GRANDSTANDS.

many winners. The Reo appropriated two firsts, and its time in another class was second best, H. J. Koehler and his Buick being the combination that had gone faster. Ray Owen had gained the idea that this particular Buick was not a regular stock car, and he had communicated to the referee his impression, along with the protest fee of \$10. For some reason or other—mayhaps, he forgot it—the driver whose car was protested at last accounts had not taken the pains to clear up the matter for the referee.

The Napier, English Daimler, Berliet, De Dietrich, Pope-Hartford, Corbin, Rambler, and Marmon were all first place cars, while close up were a dozen other makes not previously mentioned herein.

penses and prizes leave a small amount for such an extraordinary outlay.

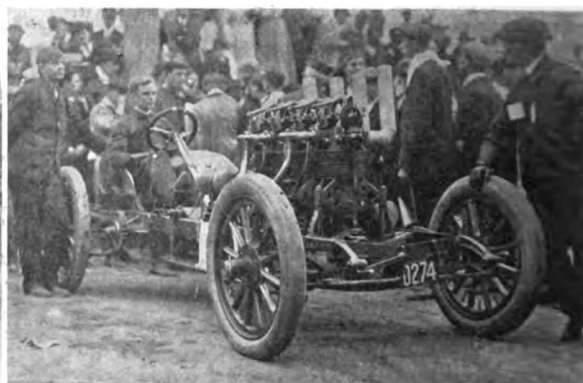
As is usually the case in a program which contains many stock events, Referee Speare had considerable to do in the way of passing upon protests; in fact, when this was written his work was still unfinished. According to the amateur rule of the A. A. A. it would seem that several who are credited with first places would lose their positions under a strict reading of the amateur definition. In the event for cars costing from \$3,000 to \$5,000, the English Daimler, listed at \$9,000, will probably be replaced by the Columbia of John Shepard, Jr., and there are other likely alterations in the official list.



R. E. TRAISSER AND HIS WINNING NAPIER.



BALD IN COLUMBIA.



THE FORMIDABLE-LOOKING AIR-COOLED PREMIER.



HANCOCK STARTING THE STEVENS-DURYEA "6."



HARDING, IN ENGLISH DAIMLER, AT ATTENTION.



F. E. WING AND MARMON WINNER.

DEAD HORSE SUMMARY.

WORCESTER CHAMPIONSHIP.

Make and driver	Cy HP	Time
Stanley, H. F. Grainger	2 20	1:31
Pierce, M. P. Whittall	4 45	2:01
Pope-Hartford, M. E.		
Dixon	4 25	2:15

STEAM STOCK CARS.

Stanley, Baldwin	20	1:26
GASOLINE, STOCK, PRICE, \$850.		
Maxwell, Mrs. H. E.		
Rogers	2 10	3:31
Maxwell, Ralph Coburn	2 10	3:45 2-5
Crawford, Crawford	2 10	4:04 1-5

AMATEUR; STOCK CARS: \$850.

Maxwell, Mrs. Rogers	2 10	3:23 2-5
Maxwell, Ralph Coburn	2 10	3:45
GASOLINE, STOCK: \$850 TO \$1,250.		
Buick, H. J. Koehler	2 22	1:52
Reo, R. M. Owen	2 16	2:01 2-5
Buick, B. N. Crockett	2 22	2:11

*Protested, claimed not to be stock car.

AMATEURS; GASOLINE, STOCK: \$850 TO \$1,250.

Reo, Pope	2 16	1:58 2-5
Buick, M. P. Whittall	2 22	2:41
Reliance, W. H. Baker	2 22	4:04
GASOLINE, STOCK: \$1,250 TO \$2,000.		
Buick, B. F. Crockett	2 22	2:35 1-5
Crawford, Weatherbee	4 24-28	2:56 1-5
Maxwell, Stockbridge	2 16	3:25 1-5
Queen, R. Driscoll	4 26-28	ditched
AMATEURS; STOCK: \$1,250 TO \$2,000.		
Reo, Thomas	2 16	2:11 2-5
Crawford, Poor	4 24-28	3:12 1-5

Franklin, Mme. Des

Roches	4 12	3:35
GASOLINE, STOCK: \$2,000 TO \$3,000.		
Pope-Hartford, Grady	4 20-25	1:50
Maxwell, Kelsey	4 35	1:57 2-5
Columbia, Barrett	4 24-28	2:05 1-5
AMATEURS; STOCK: \$2,000 TO \$3,000.		
Marmon, Emerson	4 30	2:26 2-5

GASOLINE OR STEAM, STOCK: \$2,000 TO \$3,000.

Rambler, Wilson	4 35	2:15 4-5
Marmon, Wing	4 30	2:24 2-5
GASOLINE, STOCK: \$3,000 TO \$5,000.		
Stevens-Duryea, Duryea	6 50	1:14 3-5
Columbia, Bald	4 35	2:00
Thomas, Miller	4 50	2:04 3-5
Pope-Toledo, Elliott	4 40	2:05 2-5

AMATEURS; STOCK: \$3,000 TO \$5,000.

Eng. Daimler, Harding	4 35-40	1:16
Columbia, J. Shepard, Jr.	4 40-45	1:54 4-5
Pope-Toledo, Elliott	4 35-40	2:15
Pierce, Whittall	4 45	ditched
GASOLINE, STOCK: \$5,000 AND OVER.		

Napier, R. E. Traiser	6 60	1:37 4-5
Fiat, E. Hill, Jr.	4 50	1:38 2-5

AMATEURS; GASOLINE: MORE THAN \$5,000.

De Dietrich, Harding	4 80	1:19 1-5
Eng. Daimler, Stevens	4 35-40	1:24 1-5

*Protested account being stripped.

GASOLINE CARS, HEAVY-WEIGHT.

Stevens-Duryea, Remington	6 50	1:10
Eng. Daimler, Harding	4 35-40	1:12
Napier, Hilliard	4 80	1:14
Pope-Hartford, Grady	4 25	1:28 1-5
Darracq, Campbell	4 80	1:34
Columbia, Maxim	4 24-28	1:36

CARS 851 TO 1,432 POUNDS:

Stanley, Baldwin	20	1:06 4-5
Stanley, Rogers	20	1:13 2-5
Columbia, Maxim	24	1:35
Buick, Kohler	2 22	1:43 4-5

STOCK CARS, 551 TO 851 POUNDS:

Maxwell, Mrs. H. E.		
Rogers	2 10	3:02
Maxwell, Coburn	2 10	3:13

CARS WEIGHING OVER 2,204 POUNDS:

Darracq, Campbell	4 80	1:01 2-5
Berliet, Gray	4 60	1:16
Rambler, Wilson	4 35	1:58 2-5

FREE-FOR-ALL CLASS:

Darracq, Campbell	4 80	1:02
Stevens-Duryea, Hancock	6 50	1:09 2-5
Napier, Hilliard	4 80	1:13 2-5
Premier, Moore	8 100	1:37

OPEN TO ALL GASOLINE CARS:

Darracq, Campbell	4 80	1:02 1-5
Berliet, Gray	4 60	1:19 1-5
De Dietrich, Downey	4 80	1:23 2-5
Rambler, Wilson	4 35	2:06

SPECIAL RUNABOUT CLASS:

Corbin, Markel	4 24	1:57 2-5
Corbin, Kimball	4 24	1:59 4-5
Frayser, Miller, Burrage	4 24	2:42

MOTOR CYCLES:

Indian, Kellogg	1 1/2	1:15 2-5
Indian, F. Hoyt	1 1/2	1:17
Marsch-Metz, A. Hoyt	1 1/2	1:17 3-5



A NOTABLE WINNER: POPE-HARTFORD.



B. W. GRAY AND THE BERLIET.



A RAMBLER THAT SUCCEEDED.

APPERSON WINS INDIANA CLIMB.

INDIANAPOLIS, IND., May 24.—Up the smooth but dusty Glen Valley Hill, forty-two motor-driven vehicles climbed this afternoon, some to victory, others to defeat, but all gamely, and no car made a record of which it need be ashamed.

There was some delay in getting started. A yokel midway up the hill hung his coat on the wires, and it was not until after 3 o'clock that the starter announced: "Car coming!"



"JAP" CLEMENS, A NATIONAL GLEN VALLEY CLIMBER.

Those at the top gathered on the hillsides that formed a natural amphitheater, strained their eyes to see who was coming, and a few seconds later Edgar Apperson shot over the tape in a 40-horsepower Apperson. The time was 31 1-5 seconds, a lively pace for the first contestant to set, for none of the others in all of the events was able to touch the mark.

Unfortunately it was impossible to get the hill for exclusive use, and frequently it was necessary to hold a car for an instant while flagmen stopped some farmer and his slow-going horses before they could block the right of way. But the farmers, without exception, were good natured, and in no instance refused the request to wait a few minutes. Summary:

FREE-FOR-ALL CONTEST FOR OWNERS.

1. Apperson, 40 h.p.; Edgar Apperson, driver..... :31 3-5
2. Buick, 20 h.p.; W. L. Carr, driver :41 2-5
3. National, 35-40 h.p.; Wall, driver :42

RUNABOUTS, WEIGHING UNDER 1,432 POUNDS.

1. Franklin, 12 h.p.; S. W. Elston, driver :35 3-5
2. Franklin, 12 h.p.; Harry Stutts, driver :53 4-5
3. Cadillac, 10 h.p.; Davidson, driver :57 4-5

RUNABOUTS, WEIGHING 1,432 TO 2,204 POUNDS.

1. Premier, 16 h.p.; Waltman, driver :42
2. Buick, 20 h.p.; Whittle, driver :42
3. Premier, 24 h.p.; Brown, driver :43 1-5



STARTING FROM BOTTOM OF DEAD HORSE HILL.



THOMAS AND REO TOP OF DEAD HORSE HILL.

TOURING CARS, WEIGHING 1,432 TO 2,204 POUNDS.

1. Stoddard-Dayton, 30-35 h.p.; Frank L. Moore, driver.... :36 2-5
2. Buick, 22 h.p.; Whittle, driver :46

TOURING CARS, WEIGHING OVER 2,204 POUNDS.

1. Marmon, 30 h.p.; Howard Marmon, driver :40 4-5
2. National, 35-40 h.p.; Clemens, driver :45 4-5
3. Peerless, 28-30 h.p.; Stutts, driver :47 2-5

STOCK CARS, LISTED \$850 AND UNDER.

1. Leader, 16 h.p.; Cherry, driver :50 3-5
2. Maxwell, 10 h.p.; Willis, driver 1:00 3-5

STOCK CARS, LISTED FROM \$850 TO \$1,500.

1. Buick, 20 h.p.; Whittle, driver :37 2-5
2. Premier, 16 h.p.; Wellsman, driver :40 3-5
3. Leader, 20 h.p.; Cherry, driver :42

STOCK CARS, COSTING \$1,500 TO \$2,000.

1. Franklin, 12 h.p.; Elston, driver :39 1-5
2. Lambert, 30 h.p.; Lambert, driver :42 4-5
3. Premier, 20 h.p.; Hammond, driver :43 3-5

STOCK CARS, LISTED FROM \$2,000 TO \$3,000.

1. Stoddard-Dayton, 35 h.p.; Moore, driver :32 1-5
2. Marmon, 30 h.p.; Howard Marmon, driver :36 3-5
3. National, 35 h.p.; Clemens, driver :38 4-5

STOCK CARS, COSTING OVER \$3,000.

1. Apperson, 40 h.p.; Edgar Apperson, driver :33
2. Peerless, 28-30 h.p.; Harry Stutts, driver :45 2-5



MRS. ROGERS EN ROUTE UPWARD IN MAXWELL.

POPE-TOLEDO WINS PRINCETON CLIMB.

PRINCETON, N. J., May 25.—F. Brooke, in a 35-horsepower Pope-Toledo, was the fastest performer in the Princeton Automobile Club's hill climb to-day, conducted up the road that runs between the canal and the campus, with a grade of about 5 per cent. The winner's time was 58 3-5 seconds; S. L. Crawford did the trip in 1:03 with an Indian motorcycle, and S. Morton, 16-horsepower Locomobile, was credited with 1:25.

BALL BEARINGS—GOOD, BAD, AND INDIFFERENT

By HENRY HESS.*

LONG ago—longer than I like to contemplate—I was introduced to ball bearings as a rider of the high bicycle. That bicycle had plain cone bearings, as the makers thought them better than ball bearings. Years later I was fortunately preserved from embarking in the business of making bicycles by the failure of the parties who were supposed to swing the financial end. The preparation for that venture naturally included the ball bearing. Again a kindly fate intervened in the shape of a drastic turn down of my propositions, as "old, old, very old," by one of our leading and still existing bicycle concerns, tempered by an acknowledgment of the fact that a contemplation of then existing ball and roller bearings made it a pardonable conclusion that instruction in first principles was much needed. For years that settled ball bearings with me; yet now again ball bearings are with me eating and drinking, waking and sleeping.

Principle Upon Which the Ball Bearing Is Built.

So long as the surface of the ground and the bottom of a plank are parallel there is no tendency to either press the rollers between, apart or together, no matter what the load that is carried. Now these two parallel surfaces may be considered as circles of infinite radius. Shorten up the radii of the two surfaces, strike the circles from a common center, fill the space between with rollers or balls, and we have the roller bearing of to-day in general; now why should there be any pressure between the adjacent rollers or balls due to and therefore proportional to the load? Yet the Patent Office, the woods and Wall Street are full of just such constructions and schemes. Try a simple experiment with any bearing—separate the balls at the top, bring them together at the bottom and press down as hard as possible on the inner race! There will be no wedging apart whatever of the bottom balls nor a bringing together of the top ones.

When the Deutsche Waffen und Munitionsfabriken decided that they had been sold a gold brick by the plausible gentleman who exchanged misinformation as to ball bearing design for a quantity of coin, they tried out all sorts of shapes. It was found that the friction was least when balls rolled between surfaces of straight-line cross section with only one point of contact with each surface. Next in order came similar surfaces with two and three point contact. For four-point contact the friction increase for similar loads was very marked, no doubt because of the difficulty in producing and maintaining under load the correct relation of the contact surfaces and the centers of revolution of the balls individually and as a planetary system around the shaft center.

Taking up the load-carrying capacity and friction together, it was found that the friction was lowest when the balls were supported in races having straight-line cross sections and with a single point of contact with each race, such point of contact lying in a plane at right angles to the axis of the shaft. It was further found that for a correctly arranged three-point bearing, again having straight-line cross sections of the race, the friction was about 50 per cent. higher and the load-carrying capacity about the same. With four-point contacts and straight-line cross sections the carrying capacity was also found to be as before, but the friction considerably higher than theoretical considerations indicated. Experimenting with races of different curvature, it was found that the carrying capacity increased with such curvature. Though the stressed particle in the race is the same whether the race have a straight-line or a curved cross section, there is still an important difference. Failure of such particle shows itself, first, by a flaking out, as is characteristic of practically all materials of any hardness. In the straight-line cross section this stressed particle can be easily flaked out,

whereas in a curved cross section there is a wedge of material at either side which supports this stressed particle so that it cannot be forced out. The greater the curvature, that is to say, the smaller the radius of curvature, the better will this stressed particle be supported and consequently the greater will be the carrying capacity.

Curved Section Must Never Depart from Its Radius.

As in every mechanism the weakest link in a chain fixes the strength of the entire element, so it is in a ball bearing. If for any reason whatever the general curved cross section is at some place converted into a straight-line section, the carrying capacity of the bearing will be governed by such straight-line section, provided that is brought under the load. Many forms of bearings have been devised in which the balls are filled through side openings, all of which involve such change in cross section and consequently a lessening of the load-carrying capacity. The only exception is a construction due to Riebe, in which the filling opening is confined to one race only and the continuity of the race restored by a suitable clip in the larger size and a filling screw in the smaller size. In this type the filling opening would be, by means of keyways or pockets and keys or screwheads on the race, retained at the unloaded side of the journal, that is to say, until some chauffeur or repairman saw fit to knock off such key of screwhead. Manifestly, in that type of bearing in which a filling opening is cut into both races, one or other of these must necessarily, once in each revolution, pass under the load and so limit the carrying capacity of the bearing.

Complete Unit Bearing Inviting Field for Inventors.

The general idea of making a ball bearing that will handle as a complete unit has proven a very inviting field to many inventors after the success of the original type was demonstrated. Consequently the filling methods, chiefly from the side, are many and various. All, however, involve an interference with correct action. Some have carried the filling cut tangent to the base of the race, or ball track, and thus form an edge at this point on which the balls strike or catch as they pass. Rounding over this edge does not do away with the difficulty, although it makes the catch less prominent when the bearing is rotated slowly. Bearings of this type, run at high speeds, will show that the balls catch at the opening and then bounce and strike the race quite a sharp blow, then rebound again, striking another blow, until this action gradually dies out in about one-third of a circumference. I have seen many such bearings in which this action was plainly shown by depressions sharply defined close to the filling opening and gradually dying further along.

Other inventors sought to avoid the loss in carrying capacity due to the side filling opening by not carrying this quite down to the base of the race way or ball track and relied on springing the outer race outward and the inner race inward while forcing in the last ball. Naturally this, in hard material, results in a crumbling of the edge over which the ball is forced close to the actual track, or, if the material is not so hard, some of it is forced inward and forms a projection that in turn interferes with the action of the balls and produces a striking point, resulting in phenomena similar to those already mentioned. With all such unclosed side-filling openings there is, of course, always a more or less pronounced tendency for a ball to come out under any intentional or accidental endwise load.

One inventor has sought to prevent this tendency of balls to come out through the filling opening by inclining the filling opening in the two races in opposite directions so that, to fill, the races must be slightly rotated with reference to one another. That unquestionably attains the end sought, but does not prevent the catching of the balls at the inner edges of these openings. An-

* A paper read before the first general meeting of the Society of Automobile Engineers in New York.

other inventor has recognized this bad feature of the balls catching at the filling openings and has therefore on one side cut away his stock in both races almost to the bottom of the race and fills in his entire series of balls by pressing them through the annular opening thus formed slightly narrower than the diameter of a ball. That device, however, brings in all of the bad features of the already described similar one-ball-at-a-time side-filling opening. Further than that, it follows that if a bearing is assembled by end-thrust in one direction, an end-thrust in the opposite direction will again dismember it and so render a bearing of that character totally unfit for such places as automobile hubs, behind the bevel pinion or gears, or wherever end-thrust may be present.

Friction, Destructive Wear, Causes and Remedies.

The bearing invented by Riebe was mentioned before and is the old D. W. F. full type. That bearing had all of the faults common to any full type of bearing, but avoided most of those with side-filling openings due to its side-filling opening being confined to one race only so that it could be located at the unloaded side of the journal and so do away with the weakening effect. As before mentioned, the edge interference of the filling opening was also done away with by a restoration of the continuity of the race by a filling piece. So long as load is uniform, as speed is uniform, as the load is not eccentrically applied and as neither shaft nor housing deflects, there will be no interference of the balls with one another. If these various conditions are not fulfilled the balls will interfere with one another with consequences that become more and more serious as loads and speeds are increased. Such consequences show themselves not only in an increase in friction, but also by a relatively early destruction of balls and races. By elastically separating the balls all of these various interferences are prevented. Although the introduction of such elastic separators necessarily lessens the total number of balls, yet the actual carrying capacity of the bearing is not decreased, because the full capacity of the balls may be realized and they may therefore be loaded to a considerably higher point and run at higher speeds than is possible with the full type except under conditions that are ideally perfect, but that are very rarely indeed attained in actual practice. Making these elastic separators correspond to about a ball diameter permitted a construction doing away entirely with all side-filling openings and so getting races of absolutely uniform cross section with no weak point and no interfering points anywhere in their circumference, therefore doing away also with all necessity for paying any attention whatever to the direction of the load or for in any way angularly fixing a race with reference to such direction. This latest improvement in ball bearings may be broadly characterized as a ball bearing having absolutely unbroken races of similar cross section on each side of a plane taken at right angles to the axis of the shaft with balls elastically separated and capable of acting individually without material interference under such adverse conditions as deflecting shafts or mountings, or sharp load or sharp speed variations, having no filling openings or cuts of any character and forming a single complete unit when assembled. But not only must a ball bearing be properly designed as to form, but the material also must be properly selected. All of the old ideas prevalent as to bearings and to wear must be dropped.

An ordinary or plain bearing changes size by a gradual wearing away of the particles. Such wear is not detrimental unless carried too far so that the play, or looseness, becomes too great. Such looseness may then be taken up by some one of many well-known and good devices for that purpose. In a ball bearing, however, there is no such thing as a wear, unless in the presence of sharp cutting grit, which, needless to say, should always be excluded. If the bearing is made of hard material and overloaded there will be a destruction of the surfaces of both balls and races by the flaking out of small particles of material. When once this has started it goes on at an increasingly rapid rate. If the material of the balls or races is too soft there will be a condensation and, of course, also a loss of correct shape, so that, instead of the original point contact, there will be surface contact and the rolling action be converted into a sliding action. The bearing then ap-

proaches the conditions of a plain sliding journal with entirely insufficient supporting surfaces. A compensation for wear in a ball bearing is an impractical matter, unless new surfaces could be brought into play. No conceivable, or at least no form of bearing heretofore brought out, can have or has such adjusting devices. It follows logically that the material of the ball bearing should be so selected that it will have no appreciable wear or change of shape, at least during the amortization life of the machine in connection with which it is employed. That necessitates the use of exceedingly hard materials, which at the same time must be tough. A very high degree of finish, the production of which at the same time does not interfere with the truth of the surfaces, is also a prime requisite, since even small roughnesses will soon be battered down by the rolling action of the balls and will result in an early destruction of the bearing. Carefully conducted experiments have shown that the difference between a mirror-like polish and a grinding finish that would be called very good indeed by high-class mechanics, is as three or four to one in the life of a bearing under similar conditions of a load, speed and material.

Granting that a bearing of proper shape and of proper material is employed, yet selection must also be governed by experience of a carrying capacity of various sizes of balls in connection with various race diameters and conditions of load and speed or shock peculiar to various mechanisms. There is no magic whatever, even in the initials D. W. F. or H. B. stamped on a bearing, that will make a 500-pound bearing stand up under 5,000-pounds load, or that will make a bearing that is good under a uniform load stand up under a similar load on, for instance, a railway axle or in the hub of an automobile.

Capacity for Enduring End Thrust and Heavy Work.

The end-thrust carrying capacity of two-point annular bearings is frequently doubted. When the German company first made up this bearing they, from purely theoretical reasons, assumed that they were not suited for receiving end-thrust and confined their recommendations to radial loads only. A series of experiments demonstrated to their very great surprise that the bearings not only would carry end-thrust, but also a very considerable amount. In fact, it was found that in what they call their light and medium-weight series one pound of end-thrust was the equivalent of between three and four pounds of radial load; that is to say, that a bearing that was rated at 1,200-pounds radial load capacity could safely take end-thrust alone up to 300 or 400 pounds. A satisfactory theoretical explanation of this peculiar fact has not yet been found, but the fact itself has been demonstrated since in practice by many thousands of bearings.

One of the hardest worked journals in any piece of mechanism is on the crankshaft of a gasoline engine. That ball bearings should stand for service such as this is little short of marvelous, yet that they do do so, at least as regards the D. W. F. or H. B., is sufficiently proven by the experience of such concerns as Hotchkiss, which uses them, not only on the main bearings, but also in the connecting rods; by Daimler's Mercedes, who has employed them for their 70-horsepower racing machines, and then for their 70-horsepower regular cars, and now also uses them for their regular 40-horsepower touring machines. Besides these concerns mentioned, many others use these bearings on the crankshafts, more particularly at the end bearings, among whom are C. G. V., Bollee and many others.

Now I can say that until quite recently I was personally about as sceptical as well could be regarding the merits of ball bearings for heavy work—not bicycles and sewing machines. While engaged in building machine tools in Berlin, I was compelled by a large customer to put ball bearings into the steps of heavy projectile turning lathes for him, he taking the responsibility for the make specified and used by him also under 8-inch naval gun-mounts with high angle fire. That experience prompted further use, and finally my resignation and return to my native shores, the proud possessor of the privilege of making my compatriots share with me in the benefits of a full knowledge of D. W. F. ball bearings.

PURDUE TESTING PLANT.

LAFAYETTE, IND., May 28.—Realizing the importance of the automobile from both commercial and pleasure standpoints, Purdue University added an automobile course of instruction. Although it has been in existence only a short time, it has already proven to be one of the most popular courses offered by the university, which is a state institution. At present the plant for the testing of automobiles is located in the locomotive engineering laboratory, and is a part of that school. It was designed some time ago by W. F. Goss, head of the Purdue Schools of Engineering; W. O. Teague, and Prof. J. R. McCool, the construction of the plant being similar to the lines followed in the locomotive testing plant.

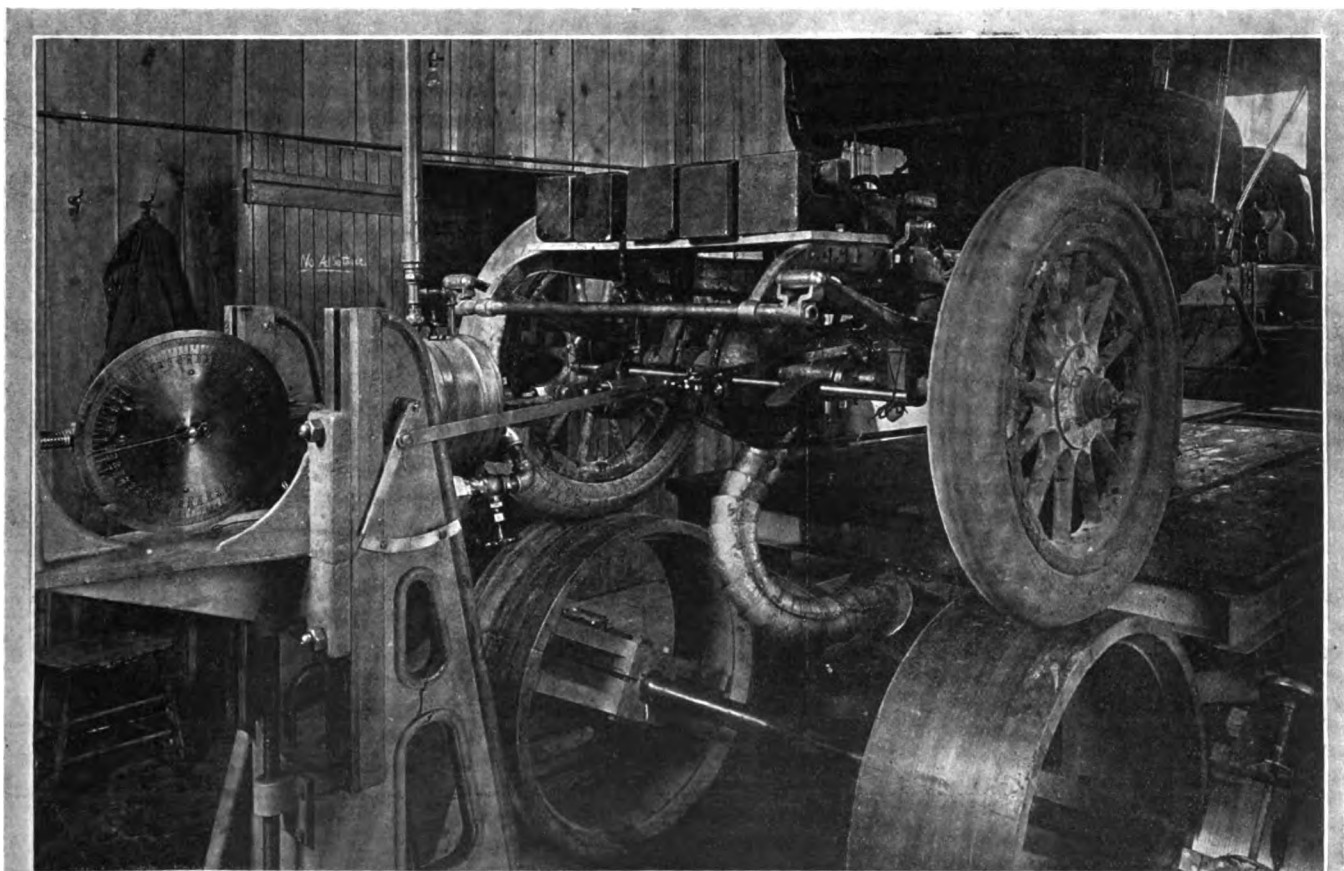
An automobile of any type can be mounted on the mechanism that constitutes the testing apparatus, and while thus mounted can be operated, its driving wheels being carried by the supporting wheels of the plant, the wheels being upon an axle which revolves in fixed bearings. In such a position the automobile is held by a connection with a traction dynamometer located at the rear of the automobile. The supporting wheels of the plant are turned against a resistance, the value of which may be varied as desired, and whatever the resistance may be it appears as a stress on the drawbar, and the resistance is regulated by a friction brake. Thus an automobile may be made to pull as little or as much on the dynamometer as desired, running under either a light or heavy load.

In testing, the horsepower delivered is equal to the pull upon the dynamometer in pounds, multiplied by the space passed over in one minute by the automobile driving wheel divided by 33,000, the space passed over being found by determining the number of revolutions of the supporting wheel, which is of fixed diameter.

So complete is the testing plant that a friction brake on the axle of the supporting wheels absorbs the energy delivered while motor-driven pressure blower forces air through adjustable piping for cooling the radiators of either gasoline or steam cars. The plant has met expectations.

CONNECTICUT'S SHORE ROAD.

NEW LONDON, CONN., May 21.—To automobile tourists the plans of the Connecticut highway commissioner, J. A. MacDonald, are of peculiar importance. He has been for several years engaged on a plan to complete, in as short time as possible, two main trunk lines across the State—one along the Long Island Sound shore, and the other branching off from New Haven and running north to Springfield, Mass. The shore route, however, is the more popular for tourists going east to the watering places, to Newport, New London, Providence or Boston. The work done this spring has put this road in better condition than it has ever been, and with the exception of a few short stretches in the vicinity of Greenwich and near the Connecticut river, this shore road affords enjoyable riding, with almost a constant view of the waters of Long Island Sound. Only the inadequate facilities for ferriage over the Connecticut river are liable to prove the least troublesome, though the United States steamboat inspectors from New London recently ordered changes to be made in the ferryboat running between Saybrook and Lyme which will rather enlarge the accommodations on that small craft. With a new and larger ferryboat now plying across the Thames river at New London, the tourist will be fully accommodated at quarter-hour intervals. Once across the Thames river, the tourist has an uninterrupted stretch of good road to Providence, 64 miles. Short stretches and hilly sections between New London and Stonington which have been in poor condition for years, were taken in hand by the highway department this spring and local automobilists report them in first-class shape. Touring over the shore route has opened earlier than usual, according to the statements of hotelkeepers in this city, who say they never before accommodated as many touring parties during April and early May as this year.



AUTOMOBILE TESTING MECHANISM IN THE ENGINEERING LABORATORY OF PURDUE UNIVERSITY, LAFAYETTE, IND.

AMERICA'S MOST POPULAR TOURING COURSE

By ROBERT BRUCE.

OPINIONS will naturally differ widely upon any subject of this kind, but probably the consensus of opinion among American autoists would favor as America's most popular touring course the east side route along the Hudson river between New York and Albany. This trip is approximately 160 miles and rich in point of scenic and historic interest.

However, this is only one of the two complete highway systems which skirt the Hudson between the Metropolitan district and the capital city and its near neighbor, Troy. But it is the most used and undoubtedly the better thoroughfare of the two, in great part the old Albany post road. When the railroad was built through to the North and West, it made the horse-drawn coach service unprofitable for long up-and-down trips. Of the old-time taverns some have survived, and are now entertaining automobilists as they did the less-fortunately mounted travelers of long ago.

The Advantages of the East Side Route.

The East side line divides almost equally at Poughkeepsie, the largest intermediate city, where will be found by far the best facilities on the route. Most of the other towns and cities provide comfortable accommodations, both in respect to hotels and garages. Signboards, while numerous, are not yet of a regularly complete order, compelling one to keep his own lookout, more or less, from beginning to end.



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However, with a little experience it becomes an easy matter to distinguish the Post Road from the innumerable short lines that cross it. Ordinarily a much more difficult task is to pick out the one cross line necessary to reach some particular place.

The situation of New York City on an island, whose most convenient exits are across the Harlem river into the "V"-shaped district between the lower Hudson and the nearer edge of Long Island Sound, has been of special advantage to the East side route. Though equally interesting both scenically and historically, the West side is separated from the largest center of population all the way by the Hudson river, crossed only by ferries, the results of which are seen in the more sparsely-settled country and the much smaller rail and road travel. Along the East bank are clustered scores of country seats which gradually improving roads and better automobiles are bringing closer to New York.

When, two or three years ago, the proposition was much agitated to construct a through highway from the Atlantic seaboard to the head of Lake Michigan, Colonel John Jacob Astor offered to subscribe \$10,000 toward the work of the New York-Chicago Road Association, provided that the route of the proposed highway should be carried up the East side instead of up the West

side, as then recommended by that association. For the time being that project dozes, but it will undoubtedly be revived and put through in time.

A Natural Gateway to the West.

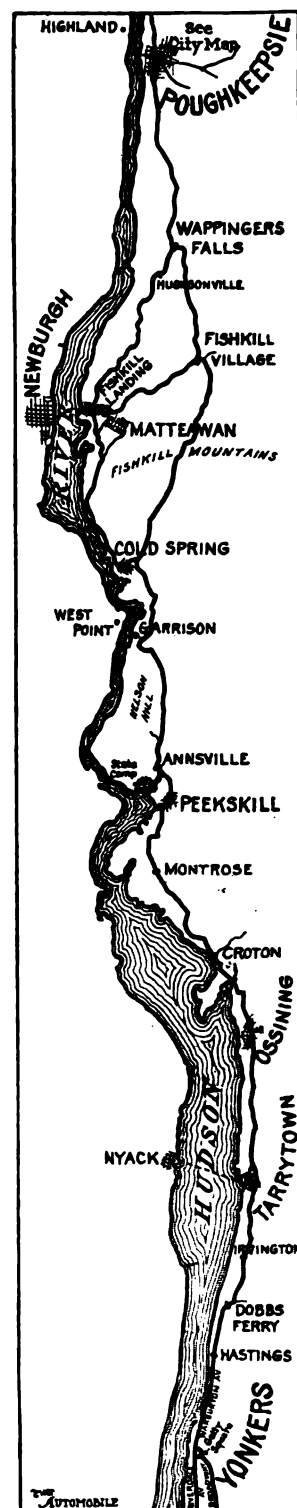
The Hudson river route will undoubtedly be a factor also in shaping even the transcontinental highways of the more distant future, and all the influence of New England will be in favor of it. By means of various popular routes most of its territory is tributary to the Hudson river valley. Travel and traffic between these six States and the West stand in precisely the same relation to the river as travel and traffic from New York City; it must cross at some point or other.

Pleasure travel, like established commerce, finds its natural way to the West through the Albany and Troy gateways. Above, the Adirondacks form a natural barrier; below, the Catskills partially shut off the way. But through the Mohawk valley, central and western New York to Buffalo and beyond, there is practically a water level across northern Ohio and northern Indiana to the head of Lake Michigan. Nature evidently intended that this should be the way of ways between the East and the West.

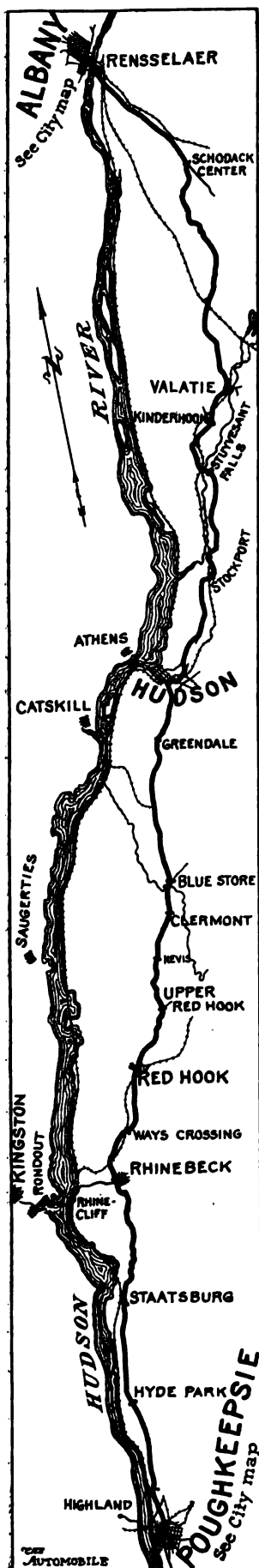
Most of the sight-seeing on the East side up-trip is usually done between the Harlem river and Peekskill, on the West side down-trip between Newburgh and New York. The middle third will average, fine driving, with fewer places, of historic note, but plenty of interesting scenery. The upper third is comparatively flat and unattractive, mostly thinly-settled farming country. From New York to Albany, or from Albany to New York, the Hudson is sometimes close by, but usually the through routes follow the roads along the higher bank.

End-to-end tours in either direction are frequently made in one day, but this is difficult to do when much time is given to sight-seeing. For convenience, the Hudson river valley is often divided broadly into the (1) lower, (2) middle and (3) upper districts; and these may ordinarily be considered as about equal with respect to time and mileage. Side trips, of which there are very many, must, of course, be calculated separately.

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The AUTOMOBILE



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Safety of the Course.

Considered as a whole, automobiling through this section—which is literally the front door of the Metropolitan district—is as safe as any other portion of equal area in the United States; and yet accidents of various kinds are reported at more or less frequent intervals. In most cases these are due to personal unfamiliarity of the operator with the character of the country, especially strangers making their first tour this way. Aside from a few places in the Highlands between Ossining and Fishkill, the grades along the East side of the Hudson are not bothersome, and may be taken with perfect safety by properly equipped touring cars. Nelson Hill, just above Peekskill, the worst on the route and the special dread of former years, has been entirely eliminated by the new road built around the east side of it; and everything else on the entire line can be ascended or descended practically without trouble. Stalled cars, except from breakage or lack of fuel, have become a rarity on the whole of this route.

Special Dangers to Avoid.

Observation and experience extending over a considerable period of time have led to the conclusion that the special dangers noted in the following paragraphs are chiefly to be looked for in the trip up or down the Hudson river.

1. **Grade Crossings**—There are innumerable and at times particularly atrocious, mostly over railroad tracks, but trolley tracks are growing rapidly in number. The thoroughfares up some distance from the water-front, and usually on higher ground, do not have as many grade crossings as the lower roads. This fact is a boon to through travel, but it is to be reckoned with every time the autoist uses any one of the ferries between Nyack and Albany.

The grade crossings most to be feared are naturally the main tracks of the New York Central railroad, which are literally covered with traffic at all hours of the day and night. Trains running frequently at sixty miles or more per hour are likely at any moment to sweep around a curve, perhaps not over a quarter-mile away, and in a twinkling of an eye pick up anything that may happen to be crossing the tracks. Most of these crossings are guarded by a "tender," and some of them are equipped with gates; but these

are only a semi-security. Particularly in the vicinity of New York City, where suburban trains add to the volume of the traffic, there is practically no assurance of safety, and the best results come from the exercise of good judgment at all times.

2. **Steep Descents to the River Front**—The fact that the best route along the East side of the Hudson follows an upper course somewhat back from the river, rather than the actual waterfront, necessarily creates a number of steep descents in order to reach the many points which nestle along the Hudson, especially in the suburban district. If an autoist not well acquainted with the route chances to turn into one of these steep byways unawares, he is much more apt to lose control of his car than under any other circumstances of his trip.

These steep roads are usually doubly dangerous because they are not only short, but because they come to an abrupt end at the water's edge, in the meantime crossing a network of tracks. In two or three instances parties who have lost their way at night have been brought to grief on the railroad tracks.

In June, 1904, a chauffeur lost his way and a party of five was carried down one of the steep grades near Kingsbridge. The machine slid down the hill at a terrific pace to the edge of the railroad tracks, which were theoretically protected by gates; but an automobile making such a descent cannot be stopped by anything of that kind. A passenger train was coming down on the northbound track and a fast freight going up on the southbound track. After breaking through the gates, the heavy car stopped with locked brakes on the northbound track, when the occupants jumped out and succeeded in saving their lives by lying down between the rails, while the two trains smashed the car into a shapeless mass. At very few of these places is the river or the tracks in view before one is actually upon them.

3. **Collisions**—For most of the 76 miles between New York and Poughkeepsie the way is deeply shaded by rows of large trees on either side of the road. For many miles, too, electric lights are scattered along this course; so that the way is not clear even on moonlight nights, while on dark nights every caution is necessary. In making this run by night particular care should be taken to avoid collisions as well as turns onto wrong roads.

A Roadside Danger—The entire Hudson river district is subject to frequent heavy rainstorms, with the result that gullies, some of them very deep and rough, are frequently worn across the road in a very short time. This is particularly the case along the actual waterfront. When a severe storm has worn bad places on the hillsides above the river, a sudden and unexpected drop of the front wheel into one of these gullies might cause the car to "turn turtle," and the end of that operation might find operator and his passengers at the bottom of a steep ravine or along the railroad track at the bottom of the grade.

When these gullies have worn down in an unusual manner, the local authorities frequently erect what are supposed to be guard posts, one post on either side of the gully and a board nailed between them. Once in a while these connected posts will be set in one or two feet from the normal outer edge of the road. Of course these are easily enough avoided in the daytime or by a horse at night, but an automobile running at speed in the twilight or after dark might have as a result one of the most unhappy collisions possible. Especially if the shock of contact with the post should overturn the car, it would be likely to fall in the down direction and make an exceedingly rough landing.

A prominent citizen of Scarborough-on-the-Hudson about a year ago appealed to the Automobile Club of America to call the attention of its members and the touring public generally to the exceedingly dangerous corner on Broadway (Albany post road) in Scarboro, a small residence place between Tarrytown and Ossining. This corner is in front of the Presbyterian church, where the Briarcliff road and the road to the Scarboro railroad station intersect Broadway. The approach to Broadway is masked on the one hand by a high brick wall, and the road is downgrade, and on the other hand by a sharp curve. Several serious accidents have narrowly been averted at this point. Tourists will do well to observe the warning signs.

SOME REQUIREMENTS OF CARBURETER DESIGN

By E. T. BIRDSALL, M.E.*

EVER since the idea of using a vaporized or gasified liquid fuel in the internal-combustion engine was suggested, the device for preparing the fuel for use in the engine has been a subject for much thought and study. Numberless designers more or less insufficiently armed with the proper experience, knowledge and data for the task, have undertaken to solve the problem with varying results. As long as the principal requirement was to furnish fuel to engines working under a practically constant load and speed and fuel was cheap, the defects of the early carbureters were not such as to interfere seriously with the operation of the engine. Other troubles, such, for example, as ignition, occupied so much of the operator's time, that the carbureter, so long as it worked at all, was neglected.

In the following remarks it is assumed that the engine used has a sufficient number of cylinders to produce a steady flow of mixture and that the carbureter is of the modern float-feed type, with a fuel jet and main and auxiliary air inlets. The fuel is assumed to be gasoline, although in the main alcohol or heavier oils require the same general conditions. The object to be attained is a mixture that will develop a maximum of power from a given size of motor with a minimum of fuel, not an average or "good-enough" result.

With the use of the internal-combustion engine under extreme variations of load and speed, as demanded by the modern automobile, with the perfection of the ignition and other features, and with the rapid rise in price of the lighter oils, the subject of carbureter design becomes one of great interest and importance. Again, in a few years, when the commercial wagon will demand a low fuel cost combined with great certainty and flexibility of engine operation, the carbureter will probably determine the extent of the development of this, the most important branch of the automobile industry.

The function of a carbureter is to supply the proper mixture of air and fuel to the engine, under all conditions of speed and power. The four essential conditions under which carbureters must work are:

First. Wide-open throttle and high engine speed, as when climbing hills or running fast on the level.

Second. Wide-open throttle and slow engine speed, as when traveling slowly on the high gear or picking up from standstill.

Third. Partly closed throttle and high engine speed, as when running fast down grade or on a low gear.

Fourth. Nearly closed throttle and low engine speed, as with engine running idle when car is standing.

For some time it was thought that the best carbureter was one that gave a constant mixture under all conditions. But we now know that a constant mixture is not the best from either the standpoint of best operation or full economy. It was also thought that the best mixture contained just sufficient oxygen to entirely consume the carbon and hydrogen. It was found, however, that a mixture with a slight excess of fuel gave the best results. These facts being demonstrated, it becomes almost obvious that the different engine speeds will demand different mixtures for maximum results. Thus at slow speeds, the mixture should be richer than at high. This is due to the fact that at low speeds more heat is lost to the cylinder walls, more compression pressure is lost by leakage and the combustion can therefore be slower, thus sustaining the pressure. At high speeds the compression is higher, due to less leakage and less loss of heat. Therefore unless the mixture was leaner at high speed there might be danger of pre-ignition. A lean and highly compressed charge also burns faster and hence gives better pressures and fuel economy than a richer one.

The quantity of mixture that an engine will take varies greatly with the speed. At slow speeds the quantity is equal to the

cubic contents of the cylinders multiplied by the number of power strokes. At high speeds of one thousand revolutions and over the quantity may drop to less than one-half the theoretical amount, depending on the design of the valves, inlet piping and carbureter passages. This peculiarity reacts upon the compression and hence on the mixture desired for best results. It will thus be seen that the design of the engine has a great deal to do with the carbureter design, which explains the well-known but seemingly mysterious fact that a carbureter that gives good results on one engine fails to maintain its reputation when applied to one of different design.

The design and class of ignition used have also a marked influence. Poorer mixtures can be used as the spark is hotter, the throttle can be more nearly closed, resulting in increased engine capacity and fuel economy.

To get the maximum power out of a given sized engine the fuel should be introduced into the cylinders as cold as possible consistent with complete evaporation, intimacy of mixture and completeness of combustion. To provide for the heat absorbed by the evaporation of the fuel, hot air is drawn in to form the mixture, the entire apparatus is heated by means of hot water or the general heat of the engine compartment under a closed bonnet is relied upon. The adjustment of this heat is an important matter, but exact knowledge on the subject is apparently nonexistent.

The ever-varying density and compositions of the fuels used and obtainable introduce many and very serious complications into the problem. These differences demand different sizes of jets, different float levels, different amounts of heat to be supplied, and different proportions of air for combustion.

Different densities and temperatures of the fuel affect to a very appreciable extent the flow of the fuel from the jet. Between extremes this has been found to vary as much as 40 per cent. Thus a carbureter exposed to atmospheric temperatures in this latitude would seem to require a wide range of adjustment.

Owing to the absence of a ready means—like the pressure gauge on the water circulation, or the voltmeter on the accumulators—of ascertaining the quality of the mixture being delivered by a carbureter, the majority of the motors in use are operating under more or less disadvantageous conditions, even if carefully and properly regulated at the outset.

The amount of reliable data and facts concerning the action of air and gasoline in a carbureter at the command of designers and students is remarkably small. Of no other part of the automobile is so little known. What is badly needed is a series of carefully planned and exhaustive experiments with data so arranged that it can be analyzed and deductions made.

STATE OF THE TRADE IN GREAT BRITAIN.

United States Consul Frank W. Mahan, of Nottingham, England, in a report recently submitted to the State Department, says there is a big increase in the automobile industry in Great Britain this year, but that foreign competition is a serious factor. About 16,000 automobiles were made in the United Kingdom in 1905, valued at about \$20,000,000. The imports were less in number, but, average value being higher, the total value was nearly the same as that of the home product. Imports have steadily increased in recent years, and have greatly increased this year so far, in comparison with 1905 and 1904. The exports last year totaled only \$2,500,000, but encouragement is found in the fact that this is an increase of over 50 per cent. in comparison with 1904 and 1903, and also in the fact that the exports in January and February of this year increased nearly 100 per cent. over those of the same months in 1905. The future of the British automobile industry looks very bright.

*A paper read before the first general meeting of the Society of Automobile Engineers in New York.

SOME HINTS THAT MAY BE HELPFUL

Suggestions on Righting the Car After Side Slip.

Now the driving season is on, a few remarks in reference to righting a car that has a tendency to slip in a wet, greasy street may not be inappropriate. Most automobilists of experience know the generally accepted method of pulling a car straight after a side slip, a knack which can readily be acquired with some practice and a little care. The operation is not a difficult one by any means. For instance, assuming a car to be running on a straight road, and for some reason the rear wheels slide toward the gutter on the right, the car will try to run toward the left-hand side of the road, at least it will point in that direction. The uninitiated driver, when he has this experience for the first time, is generally unable to act quickly, and the car may reach the pavement on the opposite side of the street before he can collect his senses. In a case of this kind, the proper method is to turn the steering wheel in the direction that the rear wheels are skidding; that is to say, if the slip is to the left, turn the front wheels to the left, and this will give the car a chance to regain its original tracking as soon as the lateral motion of the side slip is counteracted. If the steering wheel is handled quickly and with judgment, the moment the side slip is felt, its momentum can be reduced considerably. The keeping in mind of the fact that relative motion between the wheels and the road must be prevented, will act as a great deterrent for side slip. By way of illustration, never put on the brakes so hard as to entirely lock the wheels, or accelerate the speed, so as to cause them to spin on slippery streets. While the wheels run freely on the ground, side slip is not to be worried about.

For Preventing Rust of a Car's Bright Parts.

One petty annoyance to which automobile owners are subjected is the rusting of bright steel parts that are exposed to the weather, and cannot at all times be subject to the beneficent effects of a coating of oil. A few ounces of paraffine wax melted and put into a pint bottle and shaken well until dissolved will make a fine transparent coating over bright parts and will quite effectively prevent moisture from permeating and rust from attacking the parts covered. The mixture can be applied with a brush, and when it is desired to remove the deposit it can be done with a little gasoline applied with a cloth on the part where the preparation is spread.

A Very Simple Plan for Testing a Magneto.

For those who use magneto ignition and cannot get the motor to work on same when it works all right from the batteries, it is a good plan to test the magneto, as it may need remagnetizing. A simple way to prove this is to press the thumb on the armature spindle and a finger on the magnet and turn the armature. If the machine is in order, a slight electric shock will be felt, not sufficient, however, to cause discomfort. If one hand is placed on the spindle and the other on the magnet while the armature is revolved, a more distinct shock will be felt. By connecting up an alternating current voltmeter with the armature and magnet, it will indicate whether current is generated when the machine is in motion. A supplementary ignition is easily applied to a motor with a low-tension magneto ignition, and make-and-break spark. All that is necessary is a plain spark coil, a four-volt battery and some wire. One battery terminal should be connected to the frame of the motor, and the other to one terminal of the coil. The other coil terminal is connected with the wire which leads to the make-and-break igniters. The motor can then be run independently of the magneto. This plan is sometimes used as an easy starting device, as it can be switched to the magneto when the motor is running satisfactorily.

Tires Should Be Kept Inflated Hard and Evenly.

Users of non-skidding tires should not be afraid to inflate them very hard—fully 70 pounds' pressure to the square inch, and if the tires are fitted to heavy cars, about 100 pounds' pressure will be nearer the thing desired. It is practically impossible to burst a tire by inflation alone, if the fabric is sound all the way round, and the matter of temperature in summer need not enter in the matter of tire inflation in the least. When a tire is not properly inflated, it will come to grief very quickly, for the reason that the strands in the fabric rub and the friction engendered cuts them in two. When tires burst or explode it is because the strands of the fabric give way, one after the other. Too much attention cannot be paid to this matter of tire inflation, as an even air pressure in all four tubes keeps the diameters of the wheels at a standard and the wearing qualities are enhanced by a large percentage in consequence of this mechanical harmony.



A TYPICAL SCENE IN NEW JERSEY, WHICH COMMONWEALTH HAS INVESTED IN MILES OF GOOD ROADS.

THE "DOCTORING" OF A PUNCTURE.

By H. W. FIELD.

"Can you doctor up a puncture?" called the man at the steering wheel, as a touring car stopped in front of a garage and supply station in Jackson boulevard, Chicago, the other afternoon.

"Well, I guess yes," returned the keeper of the station, and the car was run into the garage.

Two men occupied the front seat and a woman sat in the tonneau. The automobilist had a spare inner tube, which was tossed out to replace the burst tube, while the two men stepped out of the car to seek refreshment at a neighboring bar, leaving the woman seated in the tonneau.

"You haven't got a jack, have you?" asked the proprietor, as the men alighted.

The reply was in the negative and it seemed to trouble the repairer just a little as they turned away. He sent a boy into the inner office for a jack, which he found after a while. But the lever bolts were loose and the clutch would not take hold to lift.

"Say, chase upstairs and ask Bill to tighten up those nuts," said the "manager" to his small assistant, and the boy got under way again. It was threatening rain outside and the woman passenger was a little uneasy. The "manager" was loosening the ring on the rim for removal of the tire, but it was loosed in all sufficiency long, long before there was a sign of the boy's reappearance. Finally the manager began to lose his temper just a little.

"Holy Moses!" he exclaimed, well under his breath, as he turned from the car in the direction of the stairs up which the boy had gone.

Meanwhile a man in a greasy jumper forty feet away had been looking on. Now he picked up a jack built for lifting a ten-ton truck and came forward with it, only to discover that the jack was at least four inches too high for the axle of the touring car. The two refreshed passengers returned.

"What in blazes! Haven't got that tire off yet?" was the good-natured comment of one.

"They're looking for a jack," explained the man in the jumper.

The "manager" and the boy returned a moment later. Still the clutch would not take hold because the lever was bent until the end struck the floor.

"Get a board," said the "manager" to the boy. The boy got the board—after awhile—and the wheel was at last lifted clear of the floor. The "manager" began to peel the tire off. As he made the first turn of the wheel, grasping a spoke with his fingers, he struck a knuckle against the Columbia's close-in steering knuckle arm, clipping off a bit of skin about as big as a dime. The "manager" swore as audibly as possible with a greasy knuckle jammed into his mouth. But he got the tire off, inserted the new tube, and sent the boy for a pump. It was a hand pump, and it was not new by any means. The man in the jumper pulled the plunger out and discovered that a new washer was needed.

They fixed the plunger upstairs in about five minutes, connected the pump with the tire valve, and at the first stroke the pump hose burst with a hissing sound that might have satisfied a whole gallery at the appearance of the villain in a melodrama.

The "manager" took out his knife, cut off the end of the tube, and replaced it. At the first stroke of the plunger the distended rubber sprung a leak at sixty miles an hour.

"Get a wire!" commanded the "manager" of the small boy, who started again for the foot of the stairs, fifty feet away. The driver of the machine looked in his tool-box and brought out the pliers to bind the tube to the shank of the pump.

"Not too hard," warned the "manager" when the man in the jumper began to pump again at the end of five minutes more. The tire was distending, however, which everyone conceded

was something. Slowly it swelled out. The husband of the woman in the tonneau suggested that she step out and rest a bit, which she did. And the man in the jumper pumped away, while the "manager" closed a thumb and finger around the tube to discourage another leak that was starting.

"Say, I'll show you how to pump!" explained the good-natured driver of the machine, taking the handle of the pump from the wearying hands of the man in the jumper before the "manager" could enter a protest. At the first vigorous plunge of the piston the tube burst wide open in the middle!

"Oh, well, we can get home on that," said the driver, kicking at the tire. "Let her down, and what's the bill?"

"About half a dollar, I guess," said the "manager," sucking at his injured knuckle. "We're going to get a power pump in here as soon as we can get around to it," he added.

The driver's friend cranked the machine, helped the woman into her seat, climbed up himself, and the car backed out of the garage and into the boulevard, only to be halted a moment later by a high falsetto note from the "manager's" small assistant:

"Hi, there! you forgot your pliers!"

And it was raining cats and dogs!



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SIR CHENTUNG LANG-CHING, IN HIS WINTON.

The Chinese minister to the United States is an ardent automobilist, and the picture shows him at the wheel. In the rear seat are two of his secretaries. The scene is on the banks of the Potomac river near Washington.

GYMKHANA EVENTS AT LADIES' A. C. G. B. I.

The Ladies' Automobile Club of Great Britain and Ireland has issued its program for the club gymkhana, at Ranelagh, June 30, which last season was honored by the attendance of Queen Alexandra. A number of novel features will be introduced into the program, the leading ones of which are announced and described as follows:

Bending Race.—A, For automobiles whose greatest length and width do not exceed over all, without lamps, 9 and 5 feet, respectively; B, for such whose greatest length and width do exceed these measurements. The out-course of 250 yards consists of bending in and out between the posts to the last one, then back in a straight line. The car making the quickest run will be the winner.

Crawling Race, 100 yards. Winner to be the car which takes the longest time, on top speed throughout, without throwing out or touching the clutch or using brakes. Stopping the motor or car involves disqualification.

Ball Race.—The cars go the full course, dropping balls into tube on the course without stopping.

Police Trap Race.—The competitors make a complete circuit of the course at given speed, the winner to be the car whose speed most closely approaches that arranged for. Watches, clocks or speedometers must be removed from the car or else covered.

Tilting at Ring.—Rings about 2 1/2 inches in diameter are hung at intervals of 100 yards round the course; each ring missed adds three seconds to the total time of the car.

Appearance.—The competitors will be divided into two categories, for park and touring drives. The full course is about three-quarters of a mile over grass.

A ROADSTER WITH SURREY SEAT ATTACHMENT

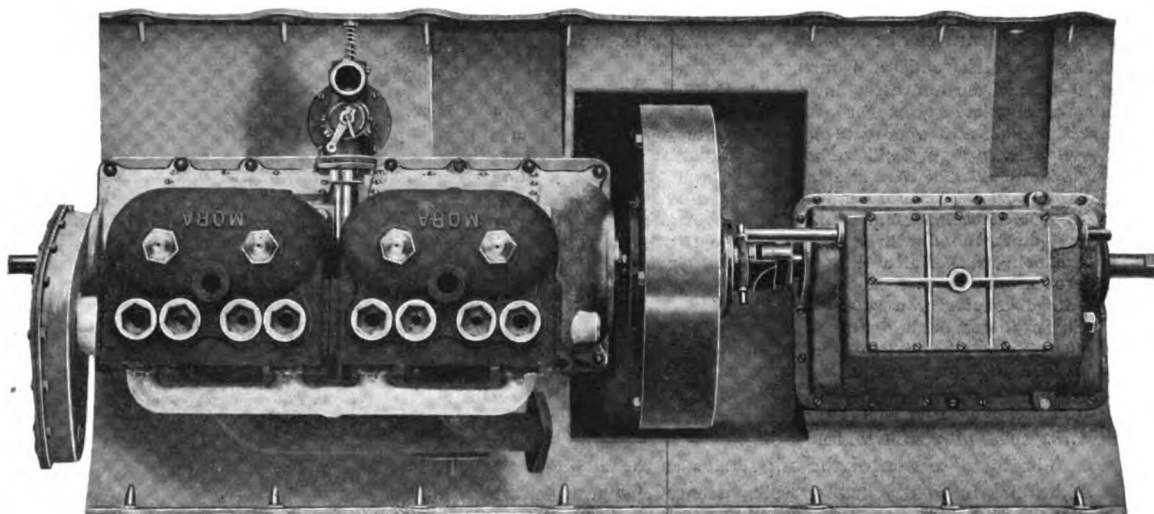
TO provide an automobile mechanically right at a reasonable price has been the aim and object of the makers of the Mora roadster. They have endeavored to keep the weight where it will not make its ownership an extravagance because of tire expense, and yet not so light as to make fast speed impossible or a matter of discomfort. Not so complicated as to require expert knowledge to keep it in order, and not so simple as to lack any essential and vital parts important to steady performance—just a happy medium car with ample power and a little to spare when necessary.

The Mora Roadster, which is the product of the Mora Motor Car Company, of Rochester, with factories at Newark, N. Y., is intended principally for use as a two-passenger car, but, to accommodate those who may occasionally desire to carry more than two people, the body is so designed that the torpedo back shown in the illustration may be removed from the roadster, and a surrey seat substituted. It only takes a matter of ten minutes to make a change of this character, and when it is made the roadster is converted into a comfortable, roomy four-passenger car. The price of the roadster complete with torpedo back is \$1,650, and the surrey seat is \$125 additional. The approximate weight is 1,700 pounds.

Much mechanical advantage is claimed for the pan construction, which is exemplified in the illustration, as support for the motor and gear set. It is even considered of greater importance than the mud-proof feature, which is original with the Mora Motor Car Company, and patented by it. The ends of the two halves of the lower base are first accurately machined, then the two halves are bolted together, and all the outside edges, inside bolt bosses, surfaces for upper case, and the journal bosses, are all machined at one sitting. This enables the production of a perfect and permanent alignment at three vitally important points—i.e., where bearings are bolted to case; where upper half of engine case, which carries the cylinders, is bolted to case; and where case carrying complete motor and gear is bolted to frame. In assembling, the crankshaft, main, and countershafts are first

aligned on the lower case, then the upper half of the gear box is put in position, and finally the cylinders are attached.

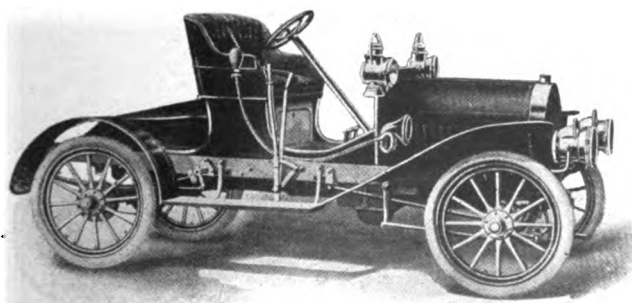
In the construction of the frame, the Mora roadster embodies some characteristics peculiarly its own. The sills are made of best close grain, carefully selected maple, stiffened by armoring through the center with a piece of 30 carbon steel, 3-16 inch thick by 4 inches deep, affording a combined advantage of wood and steel. This original feature of armoring the wood on each side is designed to stiffen the steel from sidewise strain as though it were clamped in a vise, the steel itself affording more than the necessary strength to hold a load many times that which the car will be compelled to carry. The rear axle is of the divided driving type, completely housed, running in tubular axle on ball bear-



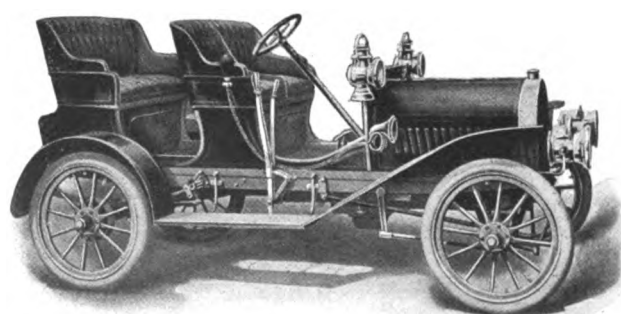
PAN CONSTRUCTION SUPPORT OF MORA MOTOR AND GEAR SET.

ings, and the front axle is tubular with ball bearing front wheels. For the front spring a transverse semi-elliptic is used, and the platform type in the rear. The wheels are artillery type, wood, and 32 inches in size; wheel base, 98 inches; tread, 54 inches.

One point strongly dwelt on by the manufacturers of the Mora is the "mechanically right" features of the motor, and its asserted high efficiency. In the language of its makers, "It is a long-stroke, slow-speed motor which takes hold of and pulls its load steadily and easily, operating as slow as four or five miles an hour and over most hills at high speed, thus necessitating few changes of gear." The motor is water-cooled, four-cylinder, 24 horsepower, 3 15-16x5 1-8, cast in pairs, fitted with special Mora carbureter, jump-spark ignition, fed by single coil and storage battery; throttle and spark control and splash lubrication system. Transmission is sliding gear, three speeds forward and reverse. The car is shaft driven.



MORA FOUR-CYLINDER ROADSTER AS A 2-PASSENGER CAR



MORA ROADSTER WITH SURREY BODY ATTACHED.

FREE ALCOHOL BILL PASSES.

WASHINGTON, D. C., May 28.—After a protracted debate the Senate, without division, Thursday last, passed the tax-free alcohol bill, and all that remains to make it a law is the President's signature. The bill was reported to the Senate from the Finance Committee on May 23, being reported by Senator Aldrich, who stated that he would call it up in the Senate at the earliest possible moment. The following day he called it up, and in a brief speech explained the various provisions of the bill. As reported to the Senate the bill read that it should become effective from and after January 1, 1907. The original bill as it passed the House was to become effective three months from its passage. Around this change revolved all the debate in the Senate. A number of Senators were unable to see why the date of taking effect should be put off to January 1, and a strong effort was made to hold it down to the period prescribed in the House bill. Senator McCumber said the people were clamoring for the bill. They want it to go into effect immediately so that they can derive some benefit from it before next winter. Senator Aldrich stood out for the date selected by the Finance Committee and he finally won out.

The essential features of the bill as it finally passed are outlined in Section 1, which reads as follows:

Sec. 1.—That from and after January 1, 1907, domestic alcohol of such degree of proof as may be prescribed by the Commissioner of Internal Revenue, and approved by the Secretary of the Treasury, may be withdrawn from bond without the payment of internal-revenue tax, for use in the arts and industries, and for fuel, light and power, provided said alcohol shall have been mixed in the presence and under the direction of an authorized government officer, after withdrawal from the distillery warehouse, with methyl alcohol or other denaturing material or materials, or admixture of the same, suitable to the use for which the alcohol is withdrawn, but which destroys its character as a beverage and renders it unfit for liquid medicinal purposes; such denaturing to be done in a denaturing bonded warehouse specially designated or set aside for denaturing purposes only, and under conditions prescribed by the Commissioner of Internal Revenue with the approval of the Secretary of the Treasury.

Section 2 tells of penalties for violations of the denaturing process. The third section of the bill relates to the employment of an additional force of chemists, etc., deemed proper for the efficient enforcement of the law, while the fourth section provides that the Secretary of the Treasury shall make full report to Congress at its next session of all appointments made under the provisions of the law, and of all regulations prescribed under the provisions thereof, and shall further report what, if any, additional legislation is necessary, in his opinion, to fully safeguard the revenue and to secure a proper enforcement of the act.

N.Y.M.C. MEMBERS SECURE JERSEY LICENSES.

NEW YORK, May 29.—An innovation has been instituted by the New York Motor Club which will undoubtedly be emulated by other clubs in the vicinity of the metropolitan district. Under the new regulations imposed by the Frelinghuysen law in New Jersey, which goes into effect July 1, every automobile touring in that State must be registered and every person driving a car must be licensed. Registrations may be had (retaining old New Jersey numbers if desired) by filling out blank forms furnished by the Secretary of State, and verifying same before a Commissioner for New Jersey in New York. For the convenience of the members of the club, Vice-President Frank J. Griffin, a member of the law committee, and also a commissioner for the State of New Jersey in New York, volunteered to be in attendance at the clubrooms in the Hotel Cumberland, Monday evening, May 28, where, without charge, he prepared and swore in a large number of applications for registrations of cars, for club members and their friends. All drivers must appear personally before one of the deputies in New Jersey for examination.

Reports from El Paso, Texas, state that the automobile mail line between Torrance and Roswell, New Mexico, has proved so satisfactory that the Government has offered to give contracts for a number of routes in New Mexico and Arizona, which are now served by the "Star" route stages.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Tours.

- June 5...—Pittsburgh, Pa., Orphans' Day and Floral Parade. Automobile Club of Pittsburgh.
- June 6...—Orphans' Day, Second Annual Celebration by the New York Motor Club.
- June 12...—Chicago, Orphans' Day. Annual Run by the Chicago Automobile Club.
- June 14...—Buffalo, N. Y., Illuminated Parade, Automobile Club of Buffalo.
- June 14...—Baltimore, Md., Orphans' Day, Second Annual Celebration, Automobile Club of Maryland.
- June 16-18—Three-Day Tour, Bay State Automobile Association, Boston to Rye Beach, N. H.
- June 18-23—Second Annual Economy Test, New York Motor Club.
- June 21-26—Second Annual Tour, Albany Automobile Club, Albany to Boston and Return.
- June 23...—Rochester, N. Y., Automobile Floral Parade at Genesee Valley Park, Rochester Automobile Club.
- July 12...—Annual A. A. A. Tour, Chicago to Bretton Woods, N. H., Rules for the Glidden Trophy operative from Buffalo.

Race Meets and Hill Climbs.

- June 9...—Hohokus, N. J., Second Annual Race Meet of the North Jersey Automobile Club (Robert Beattie, secretary, Little Falls, N. J.).
- Sept. 3...—100-Mile Road Race, on 25-Mile Circuit in Monroe County, N. Y. Rochester Automobile Club and New York State Automobile Association.
- Sept. 22...—American Elimination Trials for Vanderbilt Cup Race (Long Island Course Probable).
- Oct. 6...—Vanderbilt Cup Race, American Automobile Association.

Motorcycle Tours and Contests.

- July 3-7.—Annual Endurance Run and Meet, Federation American Motorcyclists, Rochester, N. Y.
- July 4...—Tour to Rochester, N. Y., New York Motorcycle Club.
- July 4...—Race Meet, Milwaukee Motorcycle Club.
- Sept. 3...—Race Meet, Muskegon (Mich.) Motorcycle Club.

Motor Boat Races.

- June 16...—Knickerbocker Yacht Club Race, Marblehead, Mass., to College Point, L. I.
- July 9...—Toledo Yacht Club, Open Long Distance Race for Cruising Motor Boats, 119 3-4 miles.
- July 13-21—Annual Cruise American Power Boat Association, Port Washington, L. I., to Shelter Island, Stopping at Norwalk, Thimble Islands, New London, Newport and Block Island.
- Aug. 21-23—Gold Challenge Cup, American Power Boat Association, on St. Lawrence River at Chippewa Bay.

FOREIGN.

Shows.

- Oct. 5-14—Leipzig (Germany) Exhibition, Krystall Palast.
- Nov. 1...—New Zealand International Exhibition opens at Christchurch.
- Nov. 1-16—Berlin (Germany) Automobile Exhibition.
- Nov. 15-24—London, Olympia Motor Show.
- Nov. 23-Dec. 1—London, Stanley Show, Agricultural Hall.

Tours.

- June 5-13—Herkomer Cup Touring and Speed Trials, Munich, Bavaria.
- June 11-16—Land's End to John O'Groat's. Auto Cycle Club of Great Britain.
- June 13-16—Scottish Reliability Trials.
- July 26-Aug. 15—Circuit Européen, 3,000 miles, Paris, Milan, Vienna, Berlin, Cologne, Paris.

Races, Etc.

- June 26-27—Le Grand Prix, Sarthe Circuit, France.
- July 8...—International Cup Race for Motorcycles, Cesky Club Motorcyclistu of Austria.
- July 15...—Suze-Mont Cenis Hill Climb (Italy). Automobile Club of Turin.
- Aug. 1-15—Circuit des Ardennes (Belgium).
- Aug. 9-12—Malchamps (France) Hill Climb Tests.
- Aug. 15-16—Ventoux (France) Automobile Meeting.
- Aug. 14-19—Ostend (Belgium) Meet.
- Aug. 18...—Liedekerke Cup Race.
- Aug. 23...—Semmering Hill Climb.
- Aug. 27-Sept. 2—Brescia (Italy) Automobile Meeting.
- Sept. 27...—Tourist Trophy Race, Isle of Man, A. C. of Great Britain.
- Oct. 7...—Chateau Thierry (France) Hill Climb.
- Oct. 28...—Gaillon (France) Hill Climb.

HOW ALCOHOL IS DENATURIZED IN GERMANY

Consul General Thackara, of Berlin, writing on the use of denaturized alcohol in Germany for technical purposes, says that the subject was ably and exhaustively treated by his predecessor, Consul-General Mason, in various reports on the subject. He gives the following extract from one of Consul-General Mason's reports regarding the methods in use in Germany for the denaturation of alcohol:

"For most industrial purposes alcohol is used in Germany duty free, after having been "denaturized" or rendered unfit for drinking purposes by admixture, in presence of a Government official, with a prescribed percentage or proportion of one or more of several different substances prescribed in the very elaborate statute which governs the complicated subject in Germany. There are two general classes or degrees of denaturizing, viz., the "complete" and the "incomplete," according to the purposes for which the alcohol so denaturized is to be ultimately used.

The Principal Methods of Denaturizing.

"1. Complete denaturation of alcohol by the German system is accomplished by the addition to every 100 liters (26 1-2 gallons) of spirits: (a) Two and one-half liters of the 'standard denaturizer,' made of 4 parts of wood alcohol, 1 part of pyridin (a nitrogenous base obtained by distilling bone oil or coal tar), with the addition of 50 grams to each liter of oil of lavender or rosemary; (b) one and one-fourth liters of the above "standard" and 2 liters of benzol, with every 100 liters of alcohol.

Of alcohol thus completely denaturized there was used in Germany during the campaign year 1903-4, 931,406 hectoliters denaturized by process (a), as described above, and 52,764 hectoliters which had been denaturized by process (b). This made a total of 26,080,505 gallons of wholly denaturized spirits used during the year for heating, lighting, and various processes of manufacture.

2. Incomplete denaturation—i.e., sufficient to prevent alcohol from being drunk, but not to disqualify it from use for various special purposes, for which the wholly denaturized spirits would be unavailable—is accomplished by several methods, as follows: The quality and nature of each substance given being the prescribed dose for each 100 liters (26.42 gallons) of spirits. (c) Five liters of wood alcohol or one-half liter of pyridin; (d) 20 liters of solution of shellac, containing 1 part gum to 2 parts alco-

hol of 90 per cent. purity (alcohol for the manufacture of celluloid and pegamoid is denaturized); (e) by the addition of 1 kilogram camphor or 2 liters oil of turpentine, or one-half liter benzol to each 100 liters of spirits.

"Alcohol to be used in the manufacture of ethers, aldehyde, agarcin, white lead, brom-silver gelatins, photographic papers and plates, electrode plates, collodion, salicylic acid and salts, aniline chemistry, and a great number of other purposes, is denaturized by the addition of (f) 10 liters sulphuric ether, or 1 liter of benzol, or one-half liter oil of turpentine, or 0.025 liter of animal oil.

"For the manufacture of varnishes and inks alcohol is denaturized by the addition of oil of turpentine or animal oil, and, for the production of soda soaps, by the addition of 1 kilogram of castor oil. Alcohol for the production of lanolin is prepared by adding 5 liters of benzine to each hectoliter of spirits.

"The price of denaturized alcohol varies in the different states and provinces of the Empire in accordance with the yield and consequent market price of potatoes, grain, and other materials. At the present time alcohol of 95 per cent. purity, which is the quality ordinarily used in Germany for burning, sells at wholesale from 28 to 29 pfennigs (6.67 to 6.9 cents) per liter (1.06 quarts), and at retail for 33 pfennigs (7.85 cents) per liter.

INSTANCE OF AUTO'S ENLARGING SPHERE

NEW LONDON, CONN., May 28.—A traveling man who sells surgeons' supplies made his appearance in a touring car in this city last week. He is one of the first commercial travelers to adopt this method of getting from place to place, and he declared that he saved a great deal of time by it. He calls upon physicians and hospitals, and as the physicians are always scattered over a city, and the hospitals are usually situated outside the city limits, he makes his rounds quicker than he could by any other method.

"So far as I know I am the only labor union agent in the United States owning and operating an automobile in his work," says F. J. McKerness, business agent of the United Carpenters of New Haven. Having duties similar to those of a walking delegate, Mr. McKerness has found the automobile more serviceable than "shanks' mare," and a time saver. With the automobile he is enabled to cover much territory in a day, and keep in constant touch with the union workers whose interests he has in charge.



IN ORDER TO "DISCOURAGE" THE "SCORCHERS" THE TOWN OF CHATHAM, N. J., HAS RAISED MANY CROSSWALLS

BOOKS OF THE AUTOMOBILE FIELD.

"Motor Vehicles and Motors."

In all the great fields of engineering there are certain works that stand out from the mass of technical literature as authorities on the subjects they discuss. In the field of automobile construction probably the really authoritative work—the classic—has yet to appear. Considering those volumes which hitherto have been issued on the subject, however, the foremost place is occupied by "Motor Vehicles and Motors," from the pen of W. Worby Beaumont, the well-known English engineer. The first volume of this work was issued in 1900, and it finds a place in any automobile library that is entitled to the name. Now there has been issued Volume II, so called because it is really intended to supplement or fill out the knowledge of the art embodied in the original work. This new work, however, is really complete in itself, and though it does not include all of the subject matter of the first volume, there is included within its covers such an amount of accurate information as to make it independently of the greatest value to the designer and to the automobilist who has more interest in his machine than as a mere conveyance.

The work treats of modern machines, no space being occupied with descriptions of cars of historic importance only, which were treated in the first volume. The contents are arranged in groups, the distinction being chiefly that of propulsive power. Light gasoline cars are first discussed, with immediate reference to well-known foreign types, and the succeeding chapters contain technical descriptions of the methods of construction employed by leading builders of France, Germany, and England, to the extent of about 200 pages. In two subsequent chapters American gasoline cars are discussed and details of construction given of the Oldsmobile, Cadillac, and lesser references made to the Elmore, Ford, and Rambler cars. Of the larger standard American cars, the Pierce and the Winton alone are included, while the Duryea is given the space of an entire chapter.

Component parts, such as coolers, crankshafts, and axles, and problems for the designer, including power, speed and tractive effort and vibration, and turning effort, are explained and discussed in separate chapters. Steam and internal combustion engine commercial vehicles occupy the next eighty-five pages, English types chiefly being considered. Chapter XXIX commences the section devoted to steam and electric pleasure cars, the White steamer occupying the space of a chapter. The English steamers referred to at length include the Clarkson, Lamplough, Albany, and Miesse. The famous French Serpollet is discussed briefly as to certain detail improvements of construction. Chapters on engine dimensions, piston displacement, and mean pressure, overturning and skidding, and carbureters are sandwiched in between the steam and electric car chapters.

English and French vehicles are discussed in the chapter on electrics, but only bare mention is made of American makes. The same omission is noticeable in the chapters on motor-cycles which follow, in which the Holden, Humber, and Singer machines, among others of English build, are discussed in detail. Among the foreign machines the Werner is chiefly noticed.

The concluding chapters discuss, among other technical subjects, some special engines, ignition apparatus, and clutches; also special auto steels and spring wheels are described and the cost of passenger transport service is considered.

As will be noticed by a reading of the contents, the subjects are, perhaps, not grouped together in the best way for reference, but this is offset by a well-prepared index. It is far easier to criticise a work of this character than to construct it. When space limitations have to be kept in mind, the task of compilation is an exceedingly difficult one, so great is the mass of data in an industry which has not yet settled down to any condition of systematized design, and in which individual experiment is the guide rather than the collective experience of capable engineers that is available in the older branches of mechanical engineering. And when the material for inclusion is polyglot and representative

of national and widely differing tastes and preferences, the task of the author is yet more difficult. This in part may account for the omission of needed and valuable information about the air-cooled gasoline car, which has reached a very high condition of development in America. There are also similar deficiencies in the brief chapters on components; in the case of carbureters and clutches especially. The faults are those of omission, however, and of course such a work, however exhaustive, can only supplement the careful perusal of the technical periodicals.

There are more than 500 engravings in the work, and therein is one of its most valuable features. They are not merely pictures. Where the reader can be helped to a better understanding of the text by a sectioned or assembly drawing the author has provided it. Many of the drawings are on folded inserts of sufficiently large size so that a scale can be used, and in practically all drawings the relative proportion of parts is immediately apparent. There are 677 pages of text in the work, the type on each measuring 5 by 8 inches and the bound volume 8 by 11 inches. In London it is published by Constable, and in America by the J. B. Lippincott Company, of Philadelphia. The price, bound in cloth, is \$10 net.

"The Cruise of the Conquerer."

Opportunely for summer reading, L. C. Page & Co., of Boston, have published the sequel to "The Motor Pirate" under the title "Cruise of the Conquerer." The author, G. Sydney Paternoster, rather unexpectedly brings to life the villain, Mannering, after plunging him seemingly to certain death in his marvelous automobile at the close of the first book. In the sequel he appears, after a period of seven years in hiding, as the designer and pilot of the motor boat *Conquerer*, making his first appearance as a competitor and easy winner in the International cup race in the English Channel. His nearest competitors are Sutgrove, the hero, and master of the *Mist*, and Withington, the American millionaire owner of the other leading competitor, the *Challenger*. The narrative marches almost without slackening pace through numerous exciting pursuits of the villain in his *Conquerer*, who quickly develops piratical proclivities of a reckless and almost demoniacal type, in one chapter holding up an English liner off the English coast, and in another kidnapping the Prince of Monaco from his private yacht in the Mediterranean. In the end his pursuers discover the lair of the pirate on the Spanish coast, steal the *Conquerer*, and depart after seeing the place burned by the firing of his store of "petrol" by Mannering and his mechanic. No trace of the men is found after the fire has burned itself out, and though no means of escape can be discovered, it will doubtless be an easy matter to rediscover the villains for a future story.

"Motor Vehicles for Business Purposes."

Few technical books written on the subject of the pleasure automobile fail to devote a chapter, or at least to give some attention, to the subject of commercial vehicles; but until recently the commercial vehicle industry has not been sufficiently extensive to call for the publication of many books devoted exclusively to it. The commercial vehicle now calls for special attention. An indication of this is found in the fact that A. J. Wallis-Taylor has brought out a book, "Motor Vehicles for Business Purposes," devoted exclusively to commercial vehicles, the subject being treated in a technical manner throughout. Being written by an Englishman, the book is naturally from a British point of view, and one result is that a great deal of attention is given to steam vehicles. The contents include technical data of value to designers and builders of commercial vehicles, descriptions of various types of vehicles, information on practical operation and maintenance, and so on. The book contains 295 pages, including an excellent index, and is profusely illustrated with half-tone and line engravings. The London publishers are Crosby Lockwood & Son, and the New York publishers, D. Van Nostrand & Company.

THE IGNITION TIMER AND ITS FUNCTIONS

UPON the proper design, construction, and operation of the ignition apparatus of the internal combustion motor depends, to a great extent, the efficiency, the flexibility of control and the satisfactory running of the motor. The various components that go to make up the complete ignition system—the battery or other source of current, the coils, the vibrators, the spark plugs and the timer—must, to give the best results, not only

be properly made, but must be designed with a view to being used together and must work in harmony. The timer is a device that is perhaps as little understood, as easily understood and as often misnamed as almost any other accessory of the motor. Its function of making and breaking the contact is unmistakable, but there are many persons who drive cars who would be puzzled to explain off-hand in what part of the circuit the timer is placed and what happens when the circuit is closed.

It is worthy of note

that the timer is very commonly and altogether erroneously called a "commutator." As a matter of fact, a commutator is a device for reversing the direction of an electric current—which the timer does not do—and the name is, therefore, misapplied when used to designate the timer. The "timer," properly speaking, is the device which opens and closes the low-tension ignition circuits of a gas engine at the proper intervals for producing the igniting sparks; the term "distributor" is more properly applied to the kindred device used to distribute the high-tension current when a single coil is used for the ignition of a plurality of cylinders, and can only be used in connection with a timer in the primary circuit.

The timer is driven at half the speed of the crankshaft of the motor, and so makes one complete revolution while the motor is completing one cycle of operations. The timer must close the circuit once during its revolution for every cylinder of the engine, and there are, therefore, as many contact pieces as there are cylinders.

Essentially the timer consists of a round box of fiber, hard rubber or other suitable insulating material, with a bearing in the middle of the bottom of the box for a shaft, and in the circumference the contact pieces, terminating on the outside in binding-posts. (See Fig. 1.) On the shaft, in the box or case, is an arm which swings round as the shaft rotates, and touches successively each of the contact pieces in the case. One of the most important details of the apparatus, and the detail which differs most in different timers, is the arrangement of the swinging arm and the contact device at the end of it. A

plain arm of just the right length to touch the circumferential contact pieces would, of course, wear in a very short time so that contact would be made irregularly or not at all; so in all

timers some spring arrangement is employed to take up wear and at the same time bring the parts into close and firm contact.

With regard to the path of the current, it may be well to explain that a good deal of wiring, which is always more or less of a nuisance on a car, is avoided by using the engine, frame and other metal parts to carry as part of the circuit. The primary current commencing at the battery, the current is carried

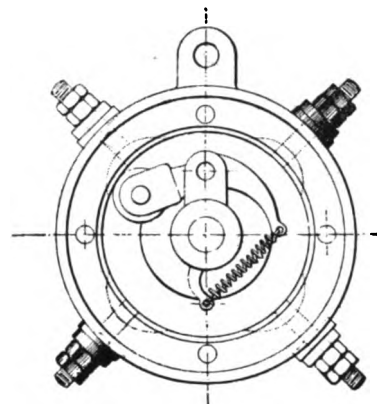


FIG. 3.—ROLLER CONTACT.

by a wire to the primary winding of the coil, then to the timer, where it passes from the binding posts and contact pieces to the swinging arm and through the shaft and its bearings to the metal of the engine or frame, and thence back to the battery through the second battery wire, which is "grounded" to some convenient part of the chassis. The switch for cutting off the current may be interposed at any convenient point in the wiring. The current is not necessarily carried first to the coil; it may first pass through the timer, the resulting action being the same in either case. The secondary or high-tension is completed in the same way, by grounding. It is interesting to note that though both high-tension and low-tension currents, in distinct circuits, may be grounded through the same engine or frame, they will not get "mixed up," but each will find its own wire and return the right way.

In Fig. 1 is shown an arm terminating in a plunger of hardened steel which is pressed

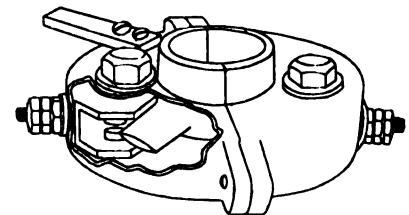


FIG. 4.—DOUBLE PLUNGER CONTACT.

outward by a spring. This gives a plain rubbing contact and the plunger will always move out to take up wear. In Fig. 2 the spring device is located in the circumferential contacts instead of in the arm, the arm being solid and a spring-backed steel ball in each contact piece projecting far enough to touch the end of the arm as it swings around. Each time a ball makes contact it is partly rotated, so that it is kept clean and bright by friction, and is continually changing the contact point.

Spring-backed steel balls are used in other ways in different timers. For instance, the circumferential contacts may be solid and a spring-backed ball carried in the end of the arm; or the solid contacts may be let into the back of the case and a ball in the under side of the arm pressed downward on them; and so on. The timer shown in Fig. 3 originated abroad and has become very popular on both sides of the Atlantic. The circumferential contacts are plain and solid; the swinging arm carries a second arm pivoted as the drawing shows. To one end of the pivoted arm is attached a tension spring tending to bring it toward the timer shaft, and the opposite end carries a large hardened steel roller which is kept in contact with the circumference of the case by the pull of the spring.

The roller idea is, like the ball idea, carried out in a variety of ways. In one timer the roller is placed on the swinging arm

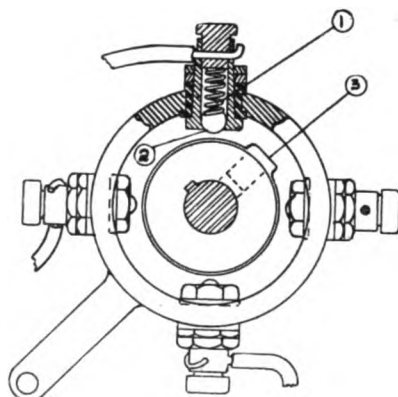


FIG. 2.—BALL CONTACTS.

with its axis at right angles to the timer shaft, and bears on the bottom of the case, into which the contacts are set. The roller is of the same diameter from end to end; but the path it travels on is of greater length at its outer circumference than nearer the

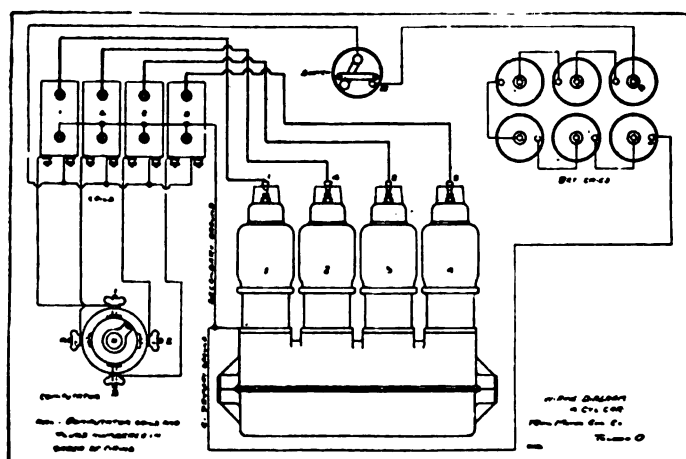


FIG. 5.—TYPICAL 4-CYLINDER VEHICLE ELECTRICAL SYSTEM.

center. Thus the roller, all parts of the circumference of which must be moving at the same velocity, must slip over some part of its path, and the slight friction thus set up keeps its surface and the surfaces of the contacts clean and bright.

A plain flattened blade of steel forms the arm of the timer shown in Fig. 4. The end of the arm passes between two little vertical plungers, normally pressed toward each other by springs and forced apart by the blade as it swings around. This timer is peculiar in having a bronze case with the contacts set into insulating bushings. In Fig. 5 is shown a typical ignition system diagram, with four coils and timer for the ignition of a four-cylinder engine.

So far all the timers referred to are designed to handle the primary or low-tension current only, the secondary circuit being a closed circuit at all times, and with this arrangement a separate induction coil is used for each cylinder. In

some systems a single coil is used for a plurality of cylinders. In this case not only must the primary winding of the coil be energized every time a charge is to be ignited in the engine, but the secondary winding must be switched successively from one cylinder spark plug to another. This latter operation—the distribution of the secondary current—is performed by a separate device called a distributor. The timer and distributor are frequently combined in a

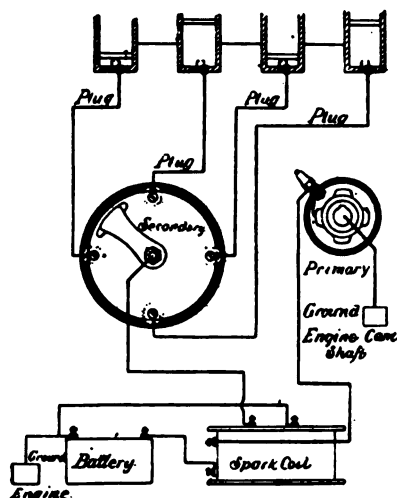


FIG. 6.—TIMER AND DISTRIBUTER.

single instrument, an example of which is shown in Fig. 7. Both are mounted on the same shaft, insulated from each other, and inclosed in the same casing. In the engraving the primary timer may be seen at the back of the case. As there is but one coil, the timer is not required to distribute the current, and there are four solid arms making successive contacts with a single contact in the case. The distributor contacts, however, are connected by wires with the spark plugs. The secondary current is carried in through a binding-post and spring-pressed ball in the case which makes contact all the

time with the secondary arm at the center. In some distributors there is no actual contact between the swinging arm and the contact points. The space between the arm and the contact, when the arm is in position for the passage of current, is so small that the high-tension current readily jumps the gap. In this way wear of the parts is avoided. Fig. 6 is a diagram of the wiring and arrangement of parts when a single coil and combined timer and distributor are used with a four-cylinder engine. The timer and distributor are shown separately to avoid confusion.

In all these timers the shaft rotates while the case containing the contacts remains stationary. In order to cause the ignition to occur earlier or later in the stroke of the motor, the case is arranged to be rotated through part of a revolution, thus causing the contacts to be made earlier or later in the revolution of the shaft. This makes it necessary for the wires leading from the timer to be left slack enough to allow for the necessary movement. To avoid these loose wires, which sometimes break from the constant vibration and movement, and are usually more or less unsightly, timers have been made in which the wires are stationary, being connected to brushes which bear on brass strips which, in turn, are in electrical connection with the contacts of the timer.

Timers for two-cycle engines are not necessarily any different from those used for four-cycle engines; they are, however, usually mounted on the crankshaft, as they must rotate at the same speed as the engine owing to the fact that the two-cycle engine has twice as many explosions per revolution as the four-cycle, and the timer must, therefore, rotate twice as fast.

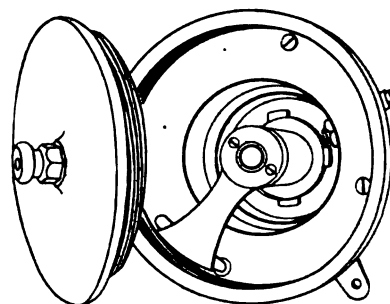


FIG. 7.—DISTRIBUTER

WISCONSIN'S GOOD LAW MAY BE REPEALED.

MILWAUKEE, WIS., May 28.—The Wisconsin automobile law, which is state-wide in its operation and which provides for a maximum speed limit of twelve miles an hour in the city and twenty miles an hour in the country, is in peril. That is, if Mayor S. M. Becker, president of the Milwaukee Automobile Club, does not change his views before the next meeting of the Legislature. Mr. Becker in an interview said that he intends to make an effort to grant all cities in the State the right to provide their own automobile regulations, in order that reckless driving may be stopped. His statement was undoubtedly prompted by a recent accident, in which a young woman was run down and killed on one of the principal downtown streets. The unfortunate mishap has aroused considerable feeling, and several editorials have appeared in local papers, demanding more stringent automobile legislation.

Previous to the past week the law governing the use of automobiles in this State has been considered very fair both to owners of cars and pedestrians. It will be remembered that through the efforts of the Milwaukee Automobile Club, and particularly its secretary, James T. Drought, a law providing for liberal speed regulations, state-wide in operation, and for the licensing and numbering of machines, was enacted, the latter provision being accepted by the autoists in exchange for the two former.

"As a matter of fact," said James T. Drought, "the law has proved successful. The automobilists have enjoyed fair speed limitations, and that pedestrians and other users of the highways have been protected is evident from the manner in which the law has operated."

THE RACING CAR OF THIS AND NEXT YEAR

By GEORGES DUPUY

Those makers who are going to participate in the international competitions this year and the next, if they hope for success, must have cars that will perform best over exceedingly fast circuits, level and smooth, with few turns and few hills. The two important courses of 1906 are those for the Automobile Club of France Grand Prix race, to be run on the famous La Sarthe Circuit, June 26 and 27, and the great American event, the Vander-

ing allowed for the magneto). We are aware that there is no incentive whatever to go under this limit. In fact, the power utilized at the rim is limited by the adherence of the driving wheels to the road, and this adherence is the "function of the weight." If the motive power exceeds the traction of the tires the wheels do not bite but slip excessively—that is, when they run faster the speed of the car does not increase and the excess of power is transformed into heat, which is prejudicial in every respect, especially to the tires. Then, to obtain more utilizable power there must be more adherence, consequently more weight, particularly on the driving wheels.

Modify Lines of the 1907 Car.

This leads us to somewhat modify the lines of the 1907 racing car. Its weight—empty—is 2,240 pounds; for the complete starting weight we must add that of two men, tools, fittings, tires, gasoline, oil, etc., which is about 600 pounds more. Total, 2,800 pounds, gross weight.

On the 2,240 pounds "empty weight of the car" one generally admits 1,300 pounds for the front axle and 900 for the rear axle. It is of advantage to put the supplementary 600 on the rear; that result is obtained by placing the two men right over the rear axle and by disposing the tank and all fittings behind them. We might approximately suppose, in all that follows, that the

rear load is 1,500 pounds. Under such conditions, if we admit 0.66 as the proper value of the coefficient friction on a nice smooth road, the adherence of the vehicle will have an average value of

$$1,500 \times 0.66 = 998 \text{ pounds.}$$

Suppose now that the builder wishes to establish a vehicle capable of racing on a straight line at an average gait of 160 kilometers (100 miles) an hour, that is to say about 41 meters a sec-

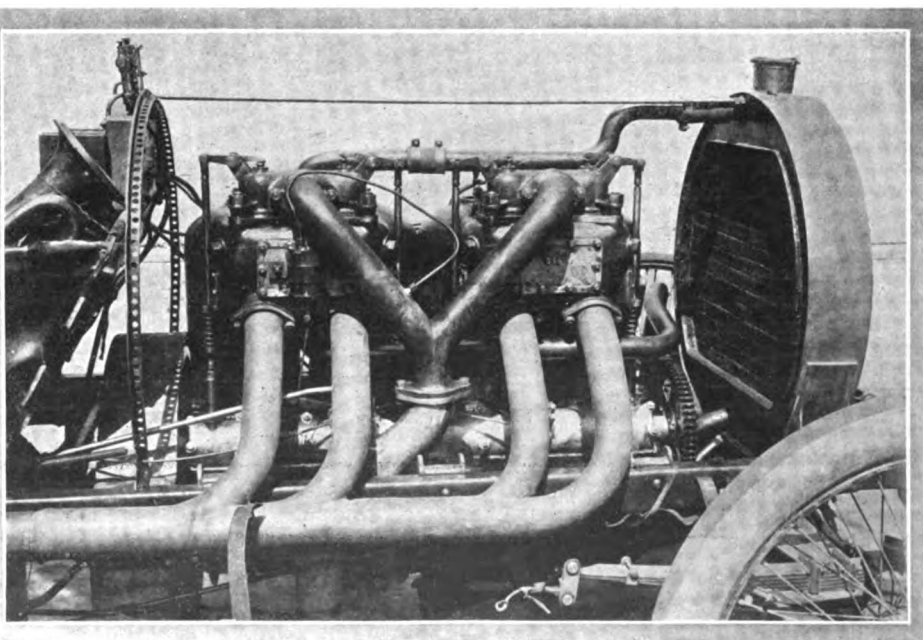
130-HORSEPOWER MOTOR OF NEW HOTCHKISS RACER.

bilt Cup race, October 6. Undoubtedly the efforts of the European builder, in constructing his fast racing monsters for 1906, were dictated chiefly by the configuration of these two racing grounds.

Very different were the conditions of last year from those now prevailing. Compelled to build a vehicle susceptible of facing the Circuit d'Auvergne, with its terrific up and down quarters of miles, its dangerous double turns bordered with precipices, the constructor sent to the starting line a much shorter and lower type, with medium wheel base, reliable clutch, powerful gear box, very carefully fitted brakes, and a motor of a non-exaggerated power. At the same time the vehicle was relatively light.

If we take into account the fact that this year the Automobile Market of the world is mainly interested in two racing events—and both are to be contested over comparatively smooth courses—we come to the conclusion that early this season the European builder formulated a theory as to what particular type of car he was going to establish. And what shall be, we next ask, the car of 1907? Will the actual engine improve every year, or is it likely to stand with its acquired stage of perfection for a certain period?

First of all, we know that all the vehicles qualified in the international events must not exceed the weight of 2,240 pounds (15 pounds in excess be-



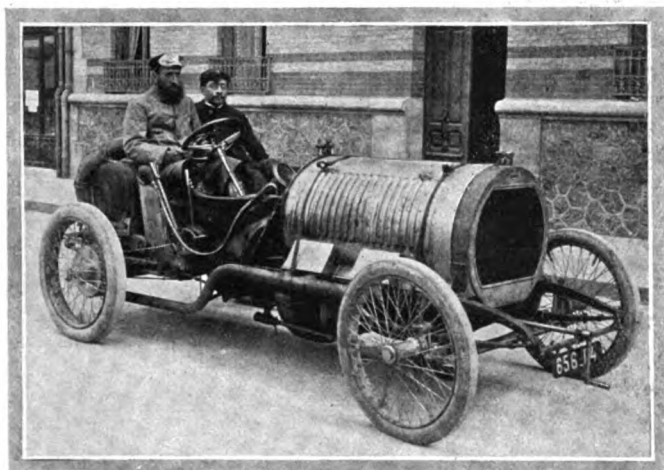
EXHAUST SIDE VIEW OF 130-HORSEPOWER HOTCHKISS RACER.

ond, we must look out for the resistances the car will have to overcome. In the first place there is the friction resistance which can be assumed to be equal to 25 pounds per ton, and which is sensibly independent of the speed. On the other hand there is the air resistance which, as we know, increases as the square of the speed, so that if "R" is the total resistance to be overcome, and "S" the speed in meters by second, we can write the following equation:

$$R = (12 \times 1.3) + KS_2 = 15.6 + KS_2.$$

The proportional coefficient "K" varies according to the forms of the car. It is of the greatest importance to diminish this and consequently to give to the vehicle appropriate lines.

An important provision would be to place underneath the car a large sheath, assuming the form of a boat hull, in order to avoid the retarding air eddies; also the builder should suppress as much as possible projections of the body, and reduce the whole rear portion of the machine as much as he can. We are justified in assuming under these conditions that the builder will get for



LE BLON IN HIS NEW HOTCHKISS RACER.

"K" a value of 0.06, so that there would be as a total value of the resistance (at the needed speed of 41 meters—50 yards—a second)

$$R = 15.6 + 0.06 \times 41 \times 31 = 116 \text{ about}$$

value notably inferior to that of the adherence and our wheels will not slip excessively.

What Shall Be Power of Motor?

Now, what shall be the power of the motor? The power to be transmitted to the rims is, as we know, the product of the resistance by the speed of the displacement—that is to say:

$$116 \times 41 = 4,756 \text{ kilogrammeters-second (by the metric system)}$$

$$\text{or } \frac{4,756}{75} = 63 \text{ horsepower about.}$$

In admitting an efficiency of 60 per cent. for the ensemble of the transmission the motor should develop a power of

$$\frac{63}{.60} = 105 \text{ M. P.}$$

These figures are somewhat less than those we are accustomed to. The great difference comes solely from the quantity adopted for "K," which demonstrates the value of taking into account that important factor—the air resistance.

With a view to meeting the unforeseen, it would be prudent to take a motive power slightly superior. It goes without saying that if we would attain a speed higher than 160 kilometers (100 miles) an hour, we should have to increase the motive power. Thus, we would see, by working a similar calculation, that for

A speed of	94 miles (150 km.)	an hour	we need an engine of	105 M.P.
"	100 "	(160 ")	"	120 M.P.
"	106 "	(170 ")	"	145 M.P.
"	112 "	(180 ")	"	220 M.P.
"	125 "	(200 ")	"	280 M.P.

But when the power increases the weight of the motor and that of the different organs of transmission increases also, and we are

aware that the constructor must not go beyond the allowed weight limit. We have, however, a certain margin in the matter of weight, of which we are going to recognize the utility. We know that Darracq has been able to place a 200 M. P. engine on a 2,200-pound car. However, I don't think there is any use in going over 120 horsepower as a maximum, strictly on account of the necessary weight margin referred to above. One may as well note, before going any further, that a constant speed of 150 kilometers an hour will, save in case of accident, permit the driver to realize on a course like the Circuit de la Sarthe—which has only three "slowing points" each lap—an average of 75 to 78 miles.

From the fact that the motor will work at full admission, so to speak, from start to finish, it must be exceptionally robust. Our builder will be compelled, perhaps, to increase the value of the coefficients of safety usually employed; particularly as far as the compression chambers and the connecting rods are concerned. He will also perfect his cooling system and his exhaust valves.

The clutch has become an element sufficiently perfected and we shall not lose time in a dissertation upon it. But what about the gear box? I think that in 1907 we should have but three speeds with high direct. As far as the Circuit de la Sarthe and the Vanderbilt Cup are concerned, two perhaps might be sufficient, as the shifting can be operated rather fast. (The new Darracq 140 M. P. has only two and the reverse.)

Concerning the Form of Transmission.

Now what shall be the transmission? I am personally an apostle of the cardan shaft. I believe that it gives better results than the chain. One may perhaps object that the non-suspended weight is more considerable and thus the wear upon the tires may be larger. I will some day try to explain my reasons for preferring the cardan shaft on the racing machine.

What Is Needed in Tires.

Now let us face the tire question, which is of so much interest, since in the A. C. F. Grand Prix race the repairs to and changing of the shoes have to be made from the supplies and with the tools carried on board the cars. My opinion is that both in la Sarthe and the Vanderbilt race there will be very few punctures, as both courses will be in the most perfect state. The chances of bursting tires, on the contrary, are numerous, for the envelopes are going to be subjected to an enormous peripheric speed and will be exposed to tearing away because of their being heavy. I believe, however, that the manufacturers of standard tires are capable of making shoes light and strong, if they only put in them enough canvas and also a sufficient number of safety bolts on the rims. I also would lean toward wheels of large diameter—910 x 90 mm. in front and 920 x 120 mm. at the rear.

As a conclusion, I think that this season and the next, in France and in America, the winning car, equipped with a motor of 110 to 125 M. P., will have averaged a speed of 75 miles; 78 to 80 miles may be realized on certain laps.

CHAUFFEURS TO HAVE NOVEL COMPETITION.

PARIS, May 21.—A great novelty in automobile competition is that which the League des Chauffeurs intends to organize this season. Notwithstanding improved springs and shock absorbers, many automobiles, when traveling at high speed, are unpleasant to ride in, giving to the passenger in the rear seats a sensation somewhat akin to seasickness. The League by its competition hopes to arrive at a better state of affairs.

Competitors must come to the starting point at the Porte Maillot, in the western suburbs of Paris, provided with sixteen milk bottles and two wire cage carriers to hold the bottles upright. The bottle carriers are attached to the floor of the car, in the one of the side entrances, the bottles filled with water and left uncorked. A waterproof cover is placed over the bottles, leaving a good space between the two, and sealed down. The car which covers the distance between the Porte Maillot and Bougival, and back to Paris at a given speed with the larger amount of water in the bottles will be the winner.

WHAT THE AUTOMOBILE CLUBS ARE DOING

Syracusans Putting Up the New Road Signs.

SYRACUSE, N. Y., May 28.—The Automobile Club of Syracuse will, if possible, have all the new signal posts put in place before the Glidden tourists reach this neighborhood. W. H. Smith went over the ground as far as Cortland last week and F. H. Elliott went to Auburn in the interest of the signs. Last week Messrs. Brown, West and Elliott took in Canastota, to which place the placing of the posts from here is in the hands of the Syracuse club.

The Utica club has charge of placing the signs beyond Canastota to Utica and activity is reported. Between Syracuse and Binghamton the respective clubs are to divide the expense and labor. The route of the Glidden tourists hereabouts has been laid out and an outline forwarded to Mr. Hower. The route is through Geneva and Auburn. Officers of the Automobile Club of Syracuse say the signs of the Syracuse district will all be in place ere the tour begins.

Washington's New Club House Nearing Completion.

WASHINGTON, D. C., May 28.—Good progress is being made in the work of erecting the new country club house of the Automobile Club of Washington. The building permit, which was issued some weeks ago, calls for an expenditure of \$4,500, and it is believed a very spacious clubhouse can be erected for this sum. When the new quarters are ready for occupancy the club will have a grand housewarming, and the occasion promises to be the greatest event of the kind in local automobile history.

At a recent meeting of the club a committee of five was appointed to investigate the feasibility of holding a hill-climbing contest under the auspices of the club. This committee is working hard on the project and there seems to be a good deal of interest manifested in the event. A club run of two days' duration is also being talked about.

Shake-up of Dry Bones Due at Ohio's Capital.

COLUMBUS, O., May 28.—There are signs that the Columbus Automobile Club will awaken from its state of coma and demonstrate to outside clubs it is still on the map. Last winter it was partly decided to hold a big meet here around the Fourth of July, but nothing has been done and in all probability the proposition will be declared off. There have been murmurings of discontent on the part of some of the officers and leading members over the inactivity of the club, and as a result a general shaking up may take place. It is understood that some of the most influential members have declared that if there is not soon a greater manifestation of zeal and progress on the part of the organization as a whole, that they will withdraw from it. This prodding, it is thought, will result in an early meeting in the club's handsome quarters which will revive old time interest in the organization and its work.

Will Bring Law Violators to Bar of Justice.

WILMINGTON, DEL., May 28.—As a result of a recent automobile accident near Middletown residents of that town are up in arms against drivers of machines who travel at excessive speed, and at a meeting of the Delaware Automobile Association held in Wilmington it was decided to assist the authorities in an effort to fix responsibility for the accident. Ever since the accident the authorities have been making an effort to obtain information as to who was in the automobile and who was responsible for the collision, and the local association, at its meeting, decided that unless the driver or owner of the machine comes forward and accepts responsibility it will offer a reward for this information.

Marylanders Will Have Orphans' Day, June 14.

BALTIMORE, May 28.—The second annual Orphans' Day outing and parade, under the auspices of the Automobile Club of Maryland, will occur on Thursday, June 14. A committee, composed of Frank W. Darling, George S. Dickey, secretary of the club, and Louis S. Greensfelder, has been appointed to attend to the arrangements and most of the charitable organizations of the city have already expressed their intention to co-operate in the effort to give the youngsters a pleasant outing. It is expected that 500 or 600 children will be in the ride. The plans include a parade in the city, a trip through Druid Hill Park, and a run out Park Heights avenue to Electric Park, where light refreshments will be served. Invitations have been extended to all automobile owners of Baltimore and the adjoining suburban towns to contribute their cars.

Bison City Automobilists Plan Illuminated Parade.

BUFFALO, May 28.—F. B. Hower, vice-president of the Automobile Club of Buffalo, and a member of the touring committee of the A. A. A. will lay out the route of the Glidden tour between this city and Saratoga. He has practically mapped out the course, but will go over it in his car to examine the route personally.

The club is making active preparations for its illuminated and decorated parade on the evening of June 4. Last year the parade of this character was a most successful affair, and this year's affair promises to eclipse its predecessor.

CLUB DOINGS IN GENERAL.

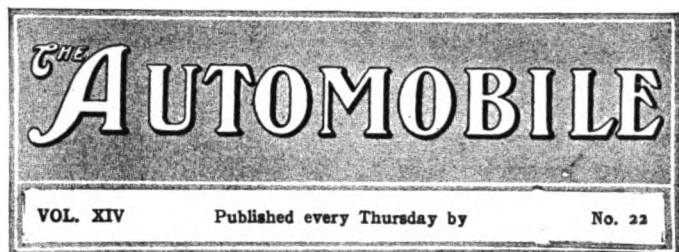
MILWAUKEE, WIS.—The Milwaukee Automobile Club has secured club quarters. A meeting of directors was recently held and it was decided to engage rooms at the St. Charles Hotel. The club is taking an active interest in automobile legislation and is anxious to assist in protecting the rights of all users of the public roads.

MONTREAL, QUE.—With a view to the improvement of roads in the vicinity of Montreal, the Automobile Club of Canada has offered two prizes of \$100 each for the best-kept sections of road between Bout de l'île and Senneville, and Beaconsfield and St. Anne's. The club is in a flourishing condition; twenty-one new members were recently added to the roll.

DALLAS, TEX.—After a considerable period of quiet, the Dallas Automobile Club recently held a meeting at which the members discussed the scheme of leasing the local trotting track for automobile races on Wednesday and Saturday afternoons. A number of club runs for the summer are being arranged for. The number of automobiles in use in Dallas is increasing, the tendency being toward large types of cars.

ASHTABULA, O.—The first automobile parade in the vicinity of Ashtabula was held on Tuesday, May 22, and twenty-two members of the Ashtabula Automobile Club lined up for the run to Conneaut. As is usually the case in automobile parades, there was more or less speeding between the larger machines. The club has forty members, and it is anticipated that within a few weeks the number will be doubled.

ST. JOSEPH, MO.—The St. Joseph Automobile Club has been permanently organized, with Huston Wyeth as president; Louis T. Golding, vice-president; R. E. Culver, secretary, and Henry Krug, Jr., treasurer. A committee was appointed to draft a constitution and by-laws. The St. Joseph automobilists plan to co-operate with automobilists in Atchison, Leavenworth, and Kansas City, with a view to securing good macadamized roads between the four cities. Active work in the good-roads field is to be carried on.



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Driving on the High Gear.

For many automobilists there seems to be a fascination about the use of the high gear in a car equipped with the usual range of change-speed gears. That a car is capable of ascending certain familiar grades on high gear is sufficient to give it a high place in the estimation of this class of persons. Just why this feat, as it may be called, should give the car preeminence, they might not be able to tell in a convincing way; perhaps it is that because the performance is of the nature of a feat that it appeals to the desire for proprietorship of a machine capable of something "out of the ordinary." It is probably the same spirit that causes a buyer to pay a phenomenal price for a car that has won some famous race.

There are advantages in high gear capacity, such as noiselessness when the drive is direct, with no change-speed gears in mesh, and, invariably, in the comparative infrequency of exhaust discharges, and for the man who finds no delight in car manipulation there is a pleasant freedom from bothersome gear changing. There is another side to be considered that does not come under the term "advantages." Were weight and cost negligible quantities in automobile construction every car could have an engine big enough to dispense with gears altogether. Commercially they have to be considered, and the use of the gear box permits of the necessary economies in these directions; and if the gear box is a good thing to carry, it certainly should be a good thing to use. The only other alternative would be to fix the drive ratio so that the car could go anywhere on the direct drive; in which case it would be altogether too slow on the level, even with the motor racing.

When a hill is to be climbed that cannot be rushed, failure to change back means a slowing down of the motor. This causes a reduction in piston speed and an extension of the time interval of

the functions of the cycle—with, of course, a long admission period. Heavy charges and heavy initial pressures are the result, with increase of stresses which, though they may not cause bending or fracture, certainly do not prolong the life of the mechanism. It should be remembered, too, that the same results will follow an injudicious use of the high gear on the level, in street traffic for instance. Acceleration after a stop for a street crossing will produce the same conditions. Throttling will not prevent this, for the throttling effect is closely related to the speed of the motor. A partially closed throttle at low motor speeds may give as high initial pressures as a wide-open throttle with the engine running at high speed when the car is going fast. It should not be forgotten that the atmospheric pressure upon which the charging of the cylinder with explosive mixture is dependent is the same, at any given elevation, whether the motor is running fast or slow.

An intelligent use of the change-speed gears is necessary for efficient operation; a lesson in this direction might be learned from observing the methods of the great drivers in a race, such as for the Vanderbilt Cup.



The Automobilists and the Orphans.

The automobilist who once a year loans his car for "Orphans' Day" can hardly fail to feel a sense of satisfaction when he reads of the pleasure that has come to the homeless ones as the result of the day in the fresh air, and treated to sights unfamiliar and seemingly wonderful. Recollect yourself the first ride that you took in an automobile and recall the exhilaration of it, the joy of traveling over the smooth highway, the refreshment that it brought to your overworked nerves, and then you will appreciate what a treat it is to these poor orphans, a comparatively small number of whom have this once-a-year opportunity of enjoying the delights of automobiling.

This decent act of automobilists has done much to dispel prejudice and diminish antagonism from those less fortunately situated, and the selfishness and disregard of the rights of others mistakenly accredited to all automobilists when such a feeling belongs only to the few is convincingly shown to be an erroneous impression.

Clubs in many cities throughout the country have followed the example of the New York Motor Club, which a year ago set the ball a-rolling at the suggestion of W. J. Morgan, who can rightly claim the original idea as emanating from his energetic brain. Again this year the club is repeating its kindly act, and though many cars have been offered it can find use for an unlimited supply, for the reason that New York City probably contains more orphans than any other city in the country. Therefore, you of a generous disposition, notify Mr. Morgan at the New York Motor Club, Fifty-fourth street and Broadway, that your cars are at the club's disposal.



The Fascination of Record Speeding.

That the general public still thrills at the spectacle of record speeding was shown conclusively at the Empire City track last Saturday when Walter Christie sent his "Blue Streak" whirling around the dusty track in 52 seconds, a performance that equaled Barney Oldfield's world record made at Los Angeles and unbroken for over two years. Unquestionably of more practical value were the less exciting events that preceded the Christie mile, but the apathetic public gave comparatively slight attention to that which should have interested them in greatest degree. These tamer contests were absorbing to the participants in the same manner that golf is of great moment to the player, but of lesser interest to the casual onlooker. In automobiling the matter of speed is still highly important from a publicity standpoint, for the Christie mile will be remembered by those who saw it for a longer period than all the rest of the program. Of course, this shouldn't be so, but the fact remains that the average man or woman these days seems to prefer the "thriller" to the more commonplace though useful happenings.

NO HUNDRED YARDS TRAPS IN BAY STATE.

Boston, May 26.—Governor Guild of Massachusetts has signed a bill increasing the automobile speed limit to twenty miles an hour. The Governor put his signature to the measure last Thursday, and it will go into effect in thirty days from that date. The twenty-mile limit applies to the country roads, where before only fifteen miles was permitted, but the limit in the thickly-settled districts has also been increased from ten to twelve miles, the limit at corners, crossings, etc., remaining at eight miles, the same as before. The new law also carries with it another very important concession to automobilists, a concession which is regarded by many as of equal importance to the raising of the speed limit. This is the fixing of the length of so-called "automobile traps." Hereafter the 100-yard traps that have been used with much profit on country roads will not be legal. In the districts where the limit is twenty miles, the trap must be at least a quarter of a mile long, and in the districts where the limit is twelve miles the trap must be at least one-eighth of a mile long. Violation of these limits, however, constitutes a *prima facie* case against the offender, so that the arresting officers will have to show only that the speed limit was exceeded in order to bring the automobilist into court. The increased speed limit and statutory definition of the length of a trap were not secured, however, without some concessions, and these are to be found in the new punishment section.

CHAIRMAN THOMPSON TO ATTEND GRAND PRIX.

The Racing Board of the American Automobile Association, serving in its capacity as the Vanderbilt Cup Commission, held a session Monday afternoon at the rooms of the Automobile Club of America, New York City. The principal subject under discussion was the French entries for the Vanderbilt race. The situation was referred with power to Chairman J. D. Thompson, who will sail for Europe, June 6, on the Baltic. It is understood that the finish of the Grand Prix, which Chairman Thompson will attend, will serve as a basis for the selection of the French cars for the Vanderbilt race, if officially a report is received verifying the printed statements that the Automobile Club of France has declined to attend to the duty as it did last year. Chairman Thompson will appoint a French representative to receive the entries of the French makers, several of whom have signified their desire to participate in the American race. The French makers realize the importance of the Vanderbilt from a publicity standpoint.

EUROPEAN CIRCUIT MAY BE POSTPONED.

Paris, May 18.—Three more entries have been made for the European Circuit touring contest, bringing the total up to fifty-two. The late arrivals are La Métallurgique (Belgium), Minerva Motor Co. (Belgium), and Aleyon (France). Entries, which, it will be remembered, were postponed from April 20 to May 20, close in two days, and there is thus no possibility of the 140 cars which were at one time looked upon as possible starters being entered for the contest. From Germany a request has come that the tour be postponed until next spring, and many a French constructor hard pushed to regain the time lost by the strike would not be adverse to such a change. The committee will meet at a very early date to decide if any change has to be made.

AUTOS SOLD BEFORE THE HORSE BLOCK.

Boston, May 26.—The automobile made its first appearance before the block in a horse auction room in Boston this week, at a sale of second-hand cars conducted by a firm which has hitherto been identified exclusively with horse and carriage auctions. Some fifteen cars were offered, and they brought very good prices, an average of about 50 per cent. of the first cost being obtained. The cars were from one to three years old, and the visitors bought on outside appearances, after seeing the cars run up and down the street outside the stable.



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SENATOR TILLMAN TAKES A WINTON RIDE.

INCREASED AUTOMOBILE EXPORTS.

The American *Exporter* calls attention to the increased exportation of automobiles as a promising indication of a growing foreign trade in that line.

The exports of American automobiles during the year 1905 were the greatest in the history of this industry, the grand total being \$2,695,655, as compared with \$1,897,510 in 1904, and \$1,643,029 in 1903. During the year our best customer was the United Kingdom, to which we exported \$707,045 worth of automobiles. Canada bought automobiles to the value of \$537,588; France, \$269,703; Italy, \$163,978; Germany, \$105,457, and the rest of Europe, \$239,379. To Mexico our automobile shipments represented a value of \$192,452; the West Indies, \$151,859. Considerable quantities were also shipped to British India, Australasia, South Africa, South America, and Oceania. That the present year will be a record breaker in the matter of automobile exports is indicated by the figures shown in the statistical returns for the first two months of 1906, during which the shipments abroad amounted in value to \$630,407, as compared with \$456,281 during the first two months of 1905. In the line of American motor boats the exports are also steadily and extensively increasing.

AERO GORDON BENNETT, SEPTEMBER 6.

The Automobile Club de France has at last secured permission from the French Government to use the Tuileries for the forthcoming Aero Gordon Bennett, and the event will take place on September 30. The balloons will ascend in alphabetical order, according to nationality, America leading off. The profit, if any, from the small admission fee will be donated to charity.



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WASHINGTON RUBBERNECKS FRONT LONGWORTH HOUSE.

WHY ONE MAKER QUIT SIXES.

E. R. Thomas, on being asked why he discontinued the construction of six-cylinder cars, made the following reply:

"It is true that the E. R. Thomas Motor Company has had a great deal of experience with six-cylinder cars, and at the start was quite enthusiastic over their fine running qualities. But after a long series of the most exhaustive and thorough tests, both by its own and outside experts, it abandoned the construction of six-cylinder touring cars and is confining its efforts to four-cylinder touring cars, because of the belief that they are far better suited to the requirements of the general public. We admit that six cylinders are flexible. The torque is more constant, and vibration less. The slight advantage, however, is not perceptible, in a car of adequate power, when on the road.

"The disadvantages of six cylinders are not only numerous, but to our way of thinking, very serious, and very far outweigh the slight advantage claimed. It is obvious that six-cylinders weigh more than four, and hence the weight is greater on the front axle. The four-cylinder car is easier to steer, is easier on front tires and is more comfortable, as the car being lighter in front will surmount obstacles with less jar and strain.

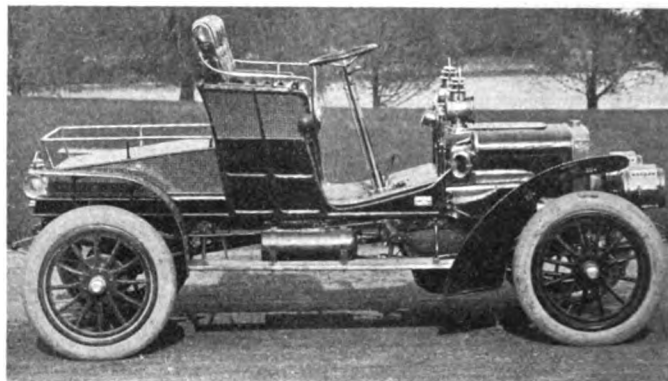
"Six cylinders require ten or more inches longitudinal space in front of the dash in excess of that necessary for four-cylinders; hence a six-cylinder car requires ten or more inches of increased wheelbase, allowing the same tonneau room. The longer the wheelbase, the longer and heavier construction is required to withstand the increased road strains. Six cylinders of equal piston area as compared to that of four will develop much less power than the four, owing to fifty per cent. increased friction of the two extra cylinders and cam bearings. The loss in general results is large, owing to the two extra pistons, the weight of the extra pistons and connecting rods working against the compression on the uplift of two extra valves, and the fact that in addition to the loss of power generated great weight is added to the car by reason of longer wheelbase and extra parts. Six cylinders require a longer and comparatively heavier crankshaft and its liability to twist, spring and break is greatly increased. Accordingly more and larger bearings are necessary.

"The complications and troubles of six cylinders compared with four, naturally increase fifty per cent.; but they seem to increase in a greater ratio. Timing of the engine is one of them; then comes the more complicated system of wiring, of lubrication, of cooling, of getting the proper mixture and distribution of the gas from the carbureter. Much more gas and cylinder oil is consumed for the amount of power, and there is much more battery consumption, and also fifty per cent. more attention to the motor is required. The problem of most manufacturers is to simplify, for the more complications, the greater number of wearing parts, the certain eventual increased annoyances and expense—and hence we regard the six-cylinder car more of a fad than practical for the average of a touring car."

A FRENCH ENGINEERING DEPARTMENT.

A significant piece of information is the announcement that E. R. Thomas, of the Thomas Motor Co., has established an engineering department in France.

"It is acknowledged that the first practical automobile originated in France," said Mr. Thomas in the course of an interview concerning the move of his company, "and that country more than any other is entitled to credit for the original improvements in the greatest number; but French, German, English, and American manufacturers have been compelled to borrow from each other ideas which have redounded to the mutual benefit of all. Positively no one



ATTRACTIVE SPECIAL BODY FOR 20-HORSEPOWER NORTHERN.

nation is independent of the other, nor can any country justly claim all credit for all improvements.

"The pneumatic tire is English; the hardened-rivet chain, annular bearings, and back-stop safety device are American. The gas engine is German, the application and accepted design French, and all the nations use American tools and many of them American steel. Thus it is proven that no one country is entitled to all credit, but that the high-class automobile is a combination of the best features of the various ideas and products of all countries.

"So you see that the maintenance of an engineering office in Paris is entirely inconsistent. We have there a corps of noted automobile experts, and they in connection with our own mechanical force are constantly planning and striving to incorporate in the Thomas—an American car, remember—the very best that the whole world can produce."

RAMBLER SHIPPING FACILITIES.

The final testing and shipping departments of the Rambler factory at Kenosha, Wis., are adjacent to the main building and along the west front of these departments extends the loading track and switches. These tracks aggregate over three-eighths of a mile, and the loading platform is 16x500 feet, a total of 80,000 square feet. The relative arrangement of tracks and platform is such that twenty cars at a time may be placed for unloading and thirty for loading.

Parallel to these tracks is a cinder path used for testing purposes. On this may at all times be found the various models of the Rambler line, and the foreman of the loading crew promptly took advantage of them.

Considerable delay had been caused at times through being compelled to await the action of the railroad company in moving the cars. Seeing the larger models of the Rambler touring cars whirling by gave rise to the idea of using them as a locomotive power. Upon trial this was found to be entirely feasible, and they were thereafter utilized.



HOW THE RAMBLER ACTS AS A LOCOMOTIVE.

PRESIDENT DICK OBJECTED.

PHILADELPHIA, May 28.—The day of the one-sided hearing and the lightning fine is over—in Montgomery county at least. Magistrate Fitzwater, of Springfield township, just over the Philadelphia line in that county, caught a Tartar in President "Bill" Dick, of the Automobile Club of Philadelphia. It has been the usual custom for the 'Squire to listen to the constable's charge, ejaculate "Twelve dollars and fifty cents fine and costs," and it was all over. Such a thing as a defense was not tolerated. President Dick, however, was not so easy. When he was arrested for doing a quarter in 47 seconds and 'Squire Fitzwater put him through the mill in the usual rapid-fire way he protested because he was not allowed to make a defense, and carried the case to the County Court, where on Thursday last Judge Swartz handed down an opinion sustaining Mr. Dick's appeal on the ground that the Justice's docket was found to be "so irregular and defective."

NOVEL SUBSCRIPTION PLAN IN WISCONSIN.

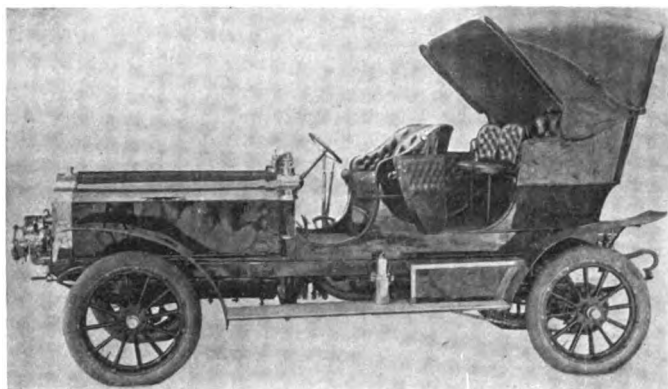
MILWAUKEE, May 28.—Plans for the Wisconsin Auto Transit Company, which will operate automobile 'buses between Manitowoc, Two Rivers, Kewaunee, Mishicot, Kiel, St. Nazianz and intermediate points, during the summer months, are progressing satisfactorily, one of the cars having been ordered. A plan has been devised by the promoters to take the place of issuing stock, and it has been favorably received at Kewaunee. A coupon book entitling the purchaser to twenty-two single trips between Kewaunee and Manitowoc will be issued at a price of \$20, which will be a gain of \$7.50 in the regular rate of four cents a mile, which the company proposes to charge. These tickets will be interchangeable and may be used by any person. Payment is made easy. One dollar, or 5 per cent. of the cost, will be collected upon delivery of the book. Nine dollars more will be asked when the line is in operation, and the balance of \$10 will be due in sixty days from that date.

The "oldest automobilist" has been discovered in London, at the age of 82. His name is George Davis, and he took to the sport eight years ago, at the age of 74.

A WESTERN 6-CYLINDER CAR.

A recent addition to the number of six-cylinder cars on the American market is the Kansas City car, manufactured by the Kansas City Motor Car Company at its works at Sheffield, Kan. The first machine was finished last week and was shipped to Minneapolis. Forty more of the same type are to be turned out this season, according to the statement of G. K. Wheeler, general manager of the Kansas City Motor Car Company.

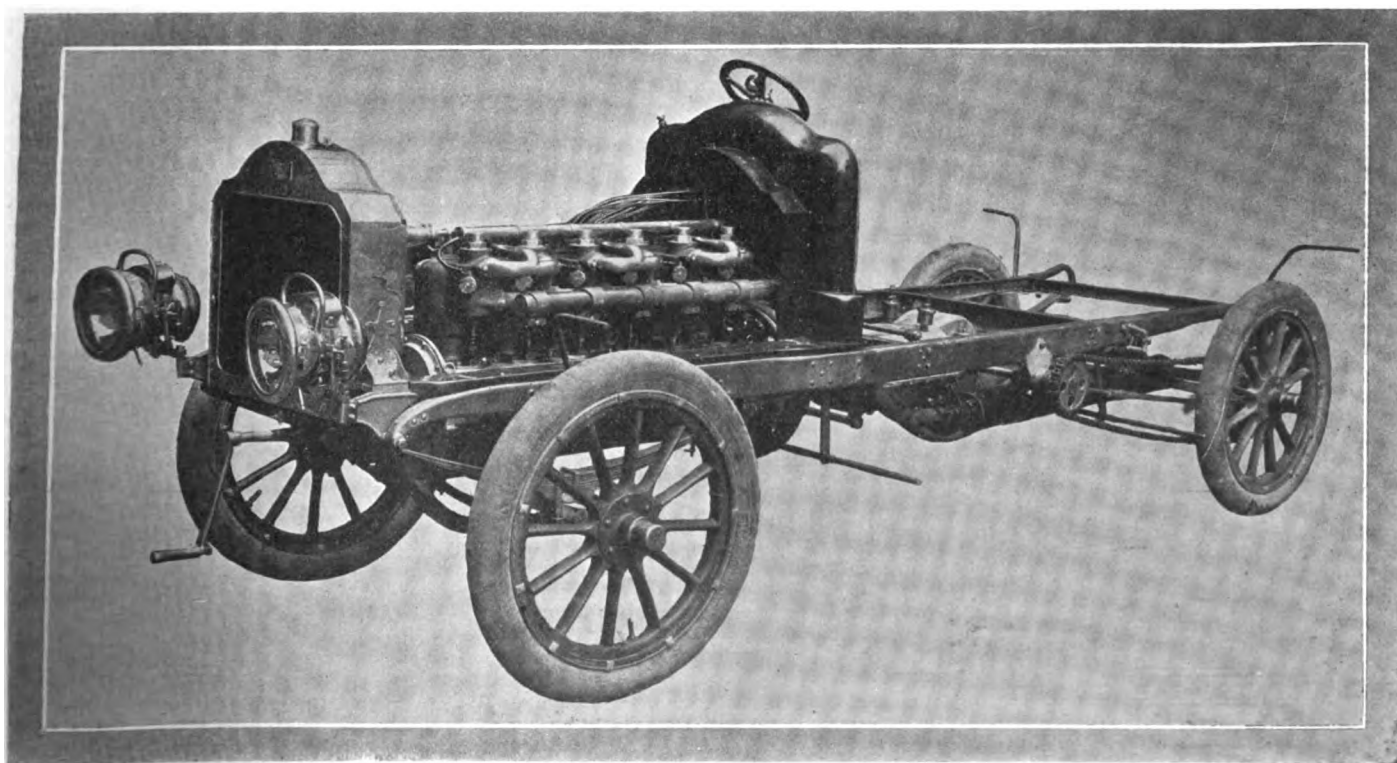
The car is built on conventional lines, generally speaking, having three-speed sliding-gear transmission, countershaft and side-chain



KANSAS CITY MOTOR CAR CO.'S SIX-CYLINDER CAR.

drive, pressed steel framing, and other features of the foreign type of touring car. The cylinders, which are cooled by water, are cast separately and have integral heads, water-jackets and valve-housing; the bore is $5\frac{1}{8}$ inches and the stroke 5 inches. The valves are all mechanically operated. Ignition is by jump spark, and both magneto and storage battery are supplied.

The wood artillery wheels are 36 inches in diameter and are fitted with 4-inch mechanically fastened tires. The wheelbase is 120 inches. The general appearance of the car is attractive; the long bonnet gives an air of speed, while the pressed steel dash and the outline of the radiator are distinctly pleasing to the critical eye.



CHASSIS OF SIX-CYLINDER CAR MANUFACTURED BY THE KANSAS CITY MOTOR CAR COMPANY.

RECENT INCORPORATIONS.

Atlas Automobile Co., Pittsburg, Pa.; to manufacture and deal in automobiles; capital, \$200,000.

The Bruno Auto Co., Brooklyn; capital stock \$5,000. Directors: D. H. A. Burns, A. E. Burns, Fred Burns, Brooklyn.

Harris Auto Marine Co., Buffalo; capital stock, \$100,000. Directors, B. P. Angell, W. D. Chamberlain, D. A. Minard, Buffalo.

O'Neill-Ollier Company, Chicago; to manufacture automobile parts. Incorporators, Charles C. O'Neill, L. F. Ollier, S. E. Gillard.

Willink Garage Co., Brooklyn, N. Y.; capital, \$10,000. Directors: H. O. Hyatt, E. H. Banaker, of Brooklyn, and G. E. Auston, New York.

New York and New Jersey Lubricant Co., New York; capital, \$5,000. Directors: T. A. Matthews, W. F. Kimball and F. J. Barnes, New York.

Atlantic Motor Car Co., New York; capital, \$25,000. Directors: J. J. Desmond, New York, R. F. Newton and S. P. Newton, Newark, N. J.

Bruns Automobile Co., of Brooklyn, N. Y.; capital stock, \$5,000. Incorporators and directors, W. H. A. Bruns, A. E. Bruns and Frederick Bruns.

Rochelle Motor Co., New York; capital stock, \$150,000. Incorporators: Edward T. Birdsall, Arthur S. Winslow and George Moore, New York.

Holmes-Booth Auto Co., Cleveland, O.; capital stock, \$25,000. Incorporators, W. N. Booth, E. Holmes, H. G. Dickman, B. J. Erlanger and J. W. Smith.

American Automobile Co., Pittsburg, Pa.; incorporators: M. S. Simms, L. C. Myers, Geo. Edkert, H. S. Stewart. The new concern will locate in the East End.

Park Place Garage and Machine Co., New York; capital stock, \$25,000. Directors, J. E. McKenna, New York; T. W. Galliard, Brooklyn; J. C. McKenna, Jersey City.

Dragon Automobile Co., Kittery, Me., to deal in motorcycles; capital stock, \$550,000. President, Harold P. Knowlton; treasurer, Albert E. Knowlton; Joseph W. Hawes.

Salt Lake Automobile Co., Salt Lake City, Utah; capital stock, \$16,000. President, W. O. Duvall; vice-president, Estella Duvall; secretary and treasurer, W. W. Rivers.

North Shore Auto Passenger Co.; common carriers of passengers; capital, \$50,000. President, S. Harvey Dow, treasurer, U. G. Haskell, clerk, W. S. Flint, Beverly, Mass.

De Long Motor Co., Syracuse, N. Y.; to manufacture motors for boats, automobiles, etc.; capital, \$25,000. Incorporators: M. E. Coe, G. E. De Long and Adolph M. Clark, all of Syracuse.

The Aerocar Co., Cleveland, O.; to manufacture automobiles and parts; capital, \$10,000. Incorporators: D. C. Westenhower, W. J. Rudolph, James C. Brooks, F. C. Howe and Al Welch.

Lewis Carriage Works, Winnipeg, Manitoba; to manufacture automobiles, bicycles, carriages, tools, etc.; capital, \$75,000. Provisional directors, E. Lewis, H. G. Banner and J. W. Bruce, of Winnipeg.

Memphis Automobile Co., Memphis, Tenn.; to deal in automobiles and automobile supplies and to operate passenger and freight automobile lines; capital stock, \$10,000. Incorporators: E. B. Meyer, A. L. Cross, E. L. Menager, William Floyd and F. Zimmerman.

THE GROWING GARAGE LIST.

The new Winton garage on Euclid avenue, Cleveland, O., which is a modern building of reinforced concrete, is practically completed.

A new garage for the Lubeck Automobile Co., of Grand Rapids, Mich., is under construction. The building is to be of brick, two stories high, 50 feet wide and 70 feet deep.

John F. Kitchen has opened a new garage on Homewood avenue, East End, Pittsburg, Pa., to be known as the Belmar, and will take agencies for two or more cars. The new garage is in the center of the Homewood, Brushton and Belmar districts.

The South Bend, Ind., Automobile and Garage Co. has been incorporated with a capital of \$5,000 to establish salesrooms and garages in South Bend. A number of the stockholders in the Studebaker Bros. Co., of South Bend, are said to be interested in the venture.

A three-story stable at 1080 Madison avenue, New York, is to be remodeled into a garage for Isaac V. Brokaw. The plans filed call for the addition to the building of three stories and the installation of an electric freight elevator. Charles F. Rose is the architect.

A new garage company has been incorporated in Cleveland, Ohio, under the name of the Boulevard Garage Company. The capital stock is \$10,000. The incorporators are Walter Brune, H. J. Dunn, H. R. Hoffman, C. O. Harmon, and Wilson S. Levens. A general garage and repair business will be handled by the new concern.

A garage in Jewett City, Conn., has been made necessary by the large volume of automobile traffic passing through that place, and a company has been formed to establish and conduct such a business. F. G. Waters is president of the new concern and A. A. Young is treasurer. The number of automobiles in and passing through the town is said to be double the number of last season.

STAGE LINES MULTIPLYING.

Plans are afoot for the organization of a company to operate a line of automobiles from Salt Lake to Provo, Utah, this summer.

Coffeyville, Kansas, has no electric street cars and will therefore soon have a line of electric cabs and 'buses for the transportation of passengers to and from points in and about the town.

Arrangements are being made by Harry K. Johnson of Vicksburg, Miss., to form a company to purchase two sight-seeing automobiles, carrying twenty-five passengers each, to take sight-seers through the historic National Park.

An automobile passenger service is to be inaugurated between the towns of Hooker and Carthage, O. T., forty miles apart. J. S. Morris, a Hooker real estate man, is in charge of the arrangements, and proposes to have two round trips made daily.

An automobile passenger service has been established between Currie's Ranch, Nevada, the present terminus of the Nevada Northern Railway, and Ely, a distance of 75 miles. The route is covered in six hours. The service is only temporary, as the railway is in process of construction and is pushing forward.

Three freight and two passenger cars are to be placed in operation at Macon, Ga., by the Auto Transfer Company, if the plans of H. J. Lamar are carried out. He was in New York recently conferring with manufacturers of trucks and stages. It is planned to operate the passenger cars on regular routes and schedule.

A short line railroad connecting Columbus, Bellefontaine and Lima, Ohio, is being constructed and will probably be equipped with gasoline-electric motor cars instead of the steam equipment originally planned. One

reason for the change of plan is the belief that the motor cars will cost very much less to run than locomotives.

The Interurban Motor Transit Co., of Lexington, Ky., which has been operating a large passenger vehicle for some months past, has purchased another machine to ply on the regular route between Lexington and Nicholasville. Later it is planned to increase the capital stock of the company operating the vehicles, and to put on additional cars.

Students and faculty of the Agricultural and Mechanical College near Byron, Texas, are much pleased with the prospect of an automobile passenger line being established between the college settlement and the town. It is planned to put four cars on the route. The plan is appreciated the more because of the disappointment of the people when a projected electric railroad failed to materialize.

C. W. Gray, of Watertown, N. Y., has started an auto 'bus line and the experiment has thus far met with success. He now has two Packard cars in commission but will have more later. The bodies of the cars were furnished by the H. H. Babcock Carriage Company of that city. It is said that this concern, which is one of the largest in the country, is at once going into the business of building auto bodies.

The Commercial Club of Coldwater, Mich., has arranged details with O. L. Mead, of Detroit, for the operation of an automobile stage line between Coldwater, Quincy and Union City. May 1 was set for the inauguration of the system. To insure the operation of the stages throughout the season, 100 books containing \$6.00 worth of tickets were issued for sale at \$5 each, and fifty of these were sold in Coldwater on the day they were offered. The books are transferable and are good for the entire season.

Frank P. Long of Wilmington, Del., has started an automobile passenger service between Middletown and Odessa, towns about three miles apart, and about 25 miles south of Wilmington. He will have a Winton car, which will carry from ten to twelve people. It is his intention to make a round trip every hour and meet all trains arriving and departing from Middletown. The railroad does not run to Odessa. A trolley line now connects the two towns and the automobile line will cover practically the same route.

Automobiles will come into direct competition with steam passenger trains in Central Wyoming within the next few weeks, when the rush of homesteaders commence to invade the Shoshone reservation district. The automobiles will be used by the Union Pacific railroad to carry passengers from Rawlins to a point about 100 miles distant. The fast trains, which arrive early in the morning, will be met at Rawlins by the automobiles, and as the country is flat and the roads excellent, it is expected that the 100 miles can be covered by early afternoon. The Union Pacific expects to land its passengers at their destination earlier than two competing roads which have rail connections for the entire distance.

The Dewhurst Interurban Automobile Company and the Interurban Motor Traction Company, of Lexington, Ky., have combined and will operate automobile passenger lines from Lexington to Nicholasville, to North Middleton and to Richmond. The line to Nicholasville is already in operation, and the other two lines will be operated as soon as the necessary cars can be obtained. A large garage, repair shop and general waiting room will be built in the center of the city. In addition to its passenger traffic business the company will engage in the general garage business and will also handle freight and express matter. The company will be incorporated with a capital stock of \$50,000.

NEWS AND TRADE MISCELLANY.

The Ford Motor Co., of Detroit, Mich., announces that it is about ready to make deliveries of the \$500 four-cylinder runabout.

Andre G. Catelain, expert repairer of foreign cars, has removed from 572 West Van Buren street to 1534 Michigan avenue, Chicago.

The McGiehan Mfg. Co., makers of odometers, have reorganized and moved into new quarters at 1557 Broadway, New York City.

The business formerly conducted by Joseph Bentley, of Methuen, Mass., has been incorporated under the name of the Joseph Bentley Hair Company.

Owing to a typographical error in the advertisement of the Novelty Tufting Machine Company, of Chicago, in last week's issue of THE AUTOMOBILE, the street number was wrongly printed. The correct address is 264 Michigan avenue.

New York automobilists desiring New Jersey registration under the new law can apply at Room 511, 1 Montgomery street, Jersey City. Applicants must appear in person, though they need not take their cars along if they do not wish to.

The Detroit plant of Morgan & Wright, tire manufacturers, is entirely new, having been recently built, and is not a factory formerly used by an automobile manufacturing concern, as was erroneously stated in last week's issue of THE AUTOMOBILE.

At the last meeting of the Buffalo Automobile Trade Association the following firms were elected to active membership: Babcock Electric Carriage Company, Knox Automobile Company, Ford Motor Company, G & J Tire Company, and MacNaughton & DuBroy.

The Novelty Tufting Machine Co., of 264 Michigan avenue, Chicago, controlling the patents covering upholstery by machinery of seats and seat cushions, has commenced suit against B. F. Everett, of Detroit, Mich., for an accounting and damages for alleged violation of contract.

R. Gordon Carew, New York agent of the F. B. Stearns Company, has sold a Stearns Pullman to the city of New York, for city officials' use. R. M. Cook, President of the New York Board of Health, also drives a Stearns. The city of Cleveland has also purchased a Stearns for general use in the city departments.

A Boston syndicate of capitalists is said to be interested in a project to centralize the automobile trade of Philadelphia, in a building large enough to give floor space to all the agencies in the city. Representatives of the syndicate have been looking for a satisfactory site in the Quaker City, but have not yet announced their selection.

More building operations are in progress on Michigan avenue, Chicago, in the automobile quarter. The building next to the store of the Excelsior Supply Company is being removed to make room for the erection of a new store for H. Paulman & Company, agents for the Pierce. The new building is to be ready about August 1.

L. E. Myers, of the Chicago Automobile Club, a member of the 1906 A. A. A. Touring Committee, will make the tour this year in the same Columbia car which he used in the Chicago-St. Paul run last season.

Previous to owning this car, Mr. Myers drove the Columbia known as "Old Betsey No. 1," which established the original road record between Chicago and New York. While driving "Old Betsey" Mr. Myers made a record of 14 hours from Chicago to St. Louis, which still stands well up toward the best performance to-day.

Considerable excitement was caused in automobile trade circles by the sudden disappearance of Rene E. Jarrige, well known as an automobilist and dealer in automobiles, and until about a year ago agent for the DeDietrich car in the United States. For the last year Jarrige conducted an automobile supply business at 41 West Thirty-third street, New York; but a few weeks ago he disappeared and it is said that a number of creditors, who are endeavoring to settle up his affairs, are out something like \$50,000.

One of the features of the centennial celebration, which will be held at Colorado Springs during September, in observance of the hundredth anniversary of the discovery of Pikes Peak, will be a big automobile carnival. An endurance run between Denver and Colorado Springs will be one of the events, while a two-days' racing program will be run off on the local track. The celebration will be of national scope. Several companies of United States soldiers will take part, and the presence of Vice-President Fairbanks and possibly President Roosevelt will add eclat to the occasion. Colorado Springs automobile men have planned a special program for Roosevelt Day should the Chief Executive see his way clear to attend.

Anticipating the passage of the act of Congress to remove the revenue duty from denatured alcohol, the Ford Motor Company, of Detroit, has had its experimental force at work determining the best type of carbureter for vaporizing alcohol for internal-combustion motors. Mr. Ford states that the results of the tests have been very gratifying, and that in the case of the six-cylinder type of motor, the average gasoline test of which is 52 horsepower (rated at 40 in catalogue), as high as 60 horsepower was obtained in several tests with alcohol as fuel. Instead of the prony brake, a dynamo is used, the armature being direct-connected to the motor shaft, so that accurate readings can be made not only at all speeds, but over a great length of time.

Bert Holcomb, who still holds the Chicago-New York road record, has probably driven as many miles between sundown and sunrise as any man living. He says that with horn and lanterns in good working order, and a disposition to drive moderately, night driving is as safe and perhaps a little safer than day driving. Roads are practically free of teams and the inability to see the minute details of grade, surface, etc., leaves the motorist comparatively free from nervous strain. Hills are easier climbed or descended, and bad places in the road are frequently gotten over more rapidly than would be the case by daylight. This may sound paradoxical to those who have not tried it, but it is a fact. It is only necessary to have good lights, to give ample warning of your approach and to avoid too high a speed rate in order not only to feel safe but to be safe.

The Whitney Manufacturing Company, of Hartford, Conn., has decided to erect a new plant, and has placed with the

Tide Water Building Company, of New York, a contract for a factory building to be erected according to plans prepared by Architect Wm. A. Boring, of New York. The building will be of reinforced concrete throughout and will be fireproof; dimensions, 228 feet long and 61 feet wide, four stories high. There will be a single-story extension 64 feet square, and the combined floor area will be about 62,000 square feet. Work will be commenced immediately and it is expected that the new quarters will be ready for occupancy about November 1 next. The factory will be divided into three departments to take care of the work in other lines than that of manufacturing chains. Special attention will be given to the comfort of employees, and lunch rooms, smoking rooms, lockers and so on will be provided for them. The new factory will be located on an eight-acre plot of ground near the Hartford Rubber Works, on Hamilton street and Bartholomew avenue, Hartford.

The Maxwell-Briscoe Motor Car Company has been making some private tests during the last month to ascertain the actual cost of operating its cars under real touring conditions, keeping account of cost of gasoline, etc., ton-mileage, and other statistical data. During the last week J. G. Emmerling, of Johnstown, Pa., made a run from Tarrytown to Johnstown. The first section of this test was by way of Nyack, Newark, and Trenton to Philadelphia, a distance of 160 miles. It was accomplished in eight hours, entirely on the high gear and without stopping the engine. From Philadelphia by way of Lancaster, Columbia, York and Gettysburg, to McConnellsburg, 185 miles, was made in eight hours, under the same conditions. The balance of the run to Johnstown via Bedford, 80 miles, was made in five hours, the middle gear being used several times in crossing the mountains. The entire run of 425 miles was made in twenty-one hours, with no adjustments except the tightening of spring clips. Twenty-six gallons of gasoline and a little over a gallon of oil were used. Another trip recently made by a Maxwell car was a record run from Tarrytown to Albany by A. S. Le Vins in five hours and forty minutes, actual running time.

Popular attention has been so strongly focused upon the development of gasoline cars during the past two or three years that many seem to have lost sight of the varied and important improvements which have been made in electric carriages. Columbia Electrics, made by the Electric Vehicle Company, are among the most popular cars outside the gasoline class, and it is interesting to note the leading changes that have been made in them since 1903. Pressed steel frames are now used, decreasing the weight and providing for easy removal of bodies. Mileage has been greatly increased by the more general use of ball bearings, improved motors and batteries and better tire equipments. Controllers are now so constructed that the electric circuit remains closed between the various stops of the lever, doing away with the jerkiness which was formerly noticeable in starting and gaining headway. All Columbia electric town carriages of the coach class have wheel steering. The spur gear form of transmission has given way to the herring-bone type, which is noiseless. In the lighter carriages single motor equipment takes the place of the two motors employed in the earlier models, with the result of increased efficiency and lessened weight. Batteries are now wired in series, permitting simpler arrangement of carriage wiring and controller connections. These and other improvements make the electric carriage of to-day a much more serviceable

and easier controlled vehicle than was its predecessor of a few years ago. The running of an up-to-date electric is so simple that women and children operate them with perfect assurance.

NEW AGENCIES ESTABLISHED.

The Boston Mechanical Company, Motor Mart, Boston, has taken the local agency for the Moon car, made in St. Louis.

Solliday & Company, Third and Wells streets, Milwaukee, Wis., have taken the agency for the Queen car, made by the C. H. Blomstrom Company, of Detroit, Mich.

John H. Gardner and Albert Kauffman have organized the Carlisle Auto & Supply Company at Carlisle, Pa., with offices and garage at 13-15 Main street that city.

A new importing house, the Itala Import Company, has been formed in New York City, and established offices, showrooms and a mechanical department at 41 West Fifty-fifth street. E. Lillie, formerly American representative of the Mors, is president and general manager of the new company, which will handle the Itala car, made at Turin, Italy.

On June 1 the Warner Instrument Company of Beloit, Wis., will open a Chicago branch at 1251 Michigan avenue, under the management of A. J. Inderrieden. The new location is admirably adapted for the requirements of the company's rapidly growing business. During the coming month all automobilists calling at the new Chicago store will be presented with the Warner Company's booklet, "Auto-Pointers," free of charge. The book retails at 50 cents, and is of much interest and value to all who drive cars.

PERSONAL TRADE MENTION.

W. F. Winchester, who has been driving the Franklin at race meets the past few seasons, has accepted a position with the Babcock Electric Carriage Company of Buffalo.

John T. Rainier, president of the Rainier Company, of New York, will sail July 1 for a four months' trip abroad, during which time he will tour the continent in a Rainier.

W. R. Densmore, until recently traveling representative of the National Association of Automobile Dealers, is now associated with C. B. Penney of the Jaynes Automobile Company of Buffalo.

Dan Canary, of Chicago, well known years ago as an accomplished bicycle trick rider, is now associated with Frank T. Fanning in the handling of Michelin tires in the Windy City. The firm moved into new quarters at 1251 Michigan avenue last week.

John L. Poole, for several years general foreign representative of the Olds Motor Works, has resigned his position with that company to accept a similar one with the Aerocar Company of Detroit. Mr. Poole was one of the first American representatives to go abroad in the interests of the automobile industry, and during the past four years has visited every continental country from Africa to Russia. Ever since the advent of the safety bicycle Mr. Poole has been identified with matters a wheel, and has been a very successful marketer of goods.

William Herrick, treasurer and manager of the William Herrick Company,

1344 Michigan avenue, Chicago, agents for the Peerless and Orient, died on Friday, May 25, the result of an attack of apoplexy while at luncheon the Tuesday previous. Mr. Herrick was also treasurer of the Drake Electric Company. He was but 40 years old at the time of his death, and for years had been a conspicuous figure in the automobile and bicycle industry. Until two years ago he was manager for Morgan & Wright, a position with which he was identified for fourteen years. His first business experience was in the hat store of his father, who died about a year ago. His mother survives him, as does also a widow and an 8-year-old son. His sudden death will be a severe shock to his many friends throughout the country.

TRADE PUBLICATIONS.

MORAWETZ CO., MILWAUKEE, WIS.—Catalogue of fur garments for automobilists.

CHAS. KAUFMANN, OSHKOSH, WIS.—Catalogue of brass launch fittings of all kinds.

YORK MOTOR CAR CO., INC., YORK, PA.—Catalogue of Pullman gasoline touring cars.

SHERWOOD MFG. CO., BUFFALO.—Catalogue of steam boiler specialties, lubricators and the like.

COLUMBUS BUGGY CO., COLUMBUS, O.—Catalogue of electric pleasure vehicles, open and inclosed.

WALLACE BARNES CO., BRISTOL, CONN.—Catalogue of small springs of all kinds and for all purposes.

CORTLAND FORGING CO., CORTLAND, N. Y.—Catalogue of forgings for automobile tops, rails and the like.

WESTERN TOOL WORKS, GALESBURG, ILL.—Catalogue of Gale gasoline automobiles for pleasure and business.

PALMER BROS., COS COB, CONN.—Catalogue of launches, gasoline marine engines, stationary engines and so on.

NEW ERA GAS ENGINE CO., DAYTON, O.—Catalogue of stationary gas engines from 10 horsepower to 125 horsepower.

SCHACHT MFG. CO., CINCINNATI.—Catalogue of Schacht gasoline automobiles with 30-horsepower four-cylinder motors.

DAVIS W. SHULER & SON, AMSTERDAM, N. Y.—Circular illustrating and describing suspension springs for automobiles.

LONG MFG. CO., CHICAGO.—Catalogue of radiators, fans, hoods and fittings for these components for gasoline automobiles.

HOLSMAN AUTOMOBILE CO., CHICAGO.—Catalogue of Holzman high-wheel buggy type automobiles with steel cable drive.

MODEL GAS ENGINE WORKS, AUBURN, IND.—Catalogue of Model gasoline automobiles, 16 horsepower and 24 horsepower.

MOTOR & MFG. WORKS CO., ITHACA, N. Y.—Special circular illustrating and describing the Ejector muffler for gasoline engines.

HENRY SHEA, BROOKLYN, N. Y.—Illustrated circular describing the P. T. C. power driven tire pump, to be carried on the car.

G & J TIRE CO., INDIANAPOLIS, IND.—Illustrated circular describing the G & J automobile tires and tire accessories for 1906.

LOBEE PUMP & MACHINERY CO., BUFFALO.—Illustrated circular describing the Lobe circulating pumps for internal combustion motors.

ST. ANNE KEROSENE CO., ST. ANNE, ILL.—Catalogue of kerosene automobile motors with two and four cylinders, and also transmissions.

WRAY PUMP & REGISTER CO., ROCHESTER, N. Y.—Catalogue of tire pumps, simple and compound, pressure indicators and automobile jacks.

NATIONAL MOTOR VEHICLE CO., INDIANAPOLIS, IND.—Catalogue of National gasoline touring cars with four-cylinder and six-cylinder motors.

HERSCHELL-SPILLMAN CO., NORTH TONAWANDA, N. Y.—Catalogue of four-cylinder and six-cylinder gasoline motors for automobiles and trucks.

STANDARD CARRIAGE LAMP CO., CHICAGO.—Catalogue of acetylene, oil and electric lamps for automobiles; also gas generators for acetylene lamps.

WESTON-MOTT CO., UTICA, N. Y.—Catalogue of automobile front and rear axles, driving gears, brakes, hubs, bearings, rims and other component parts.

AMERICAN & BRITISH MFG. CO., BRIDGEPORT, CONN.—Catalogue of pressed steel frames for automobiles, and also spring hangers and like components.

WHITE SEWING MACHINE CO., CLEVELAND, O.—"What People Say About the White Steamer," a pamphlet of testimonials from satisfied users of the White steam car.

PACKARD MOTOR CAR CO., DETROIT, MICH.—Illustrated price list of parts of the Packard 24-horsepower car. A complete list, giving the prices of all parts from a bolt upward.

THE POST & LESTER CO., Hartford, Conn.—Complete catalogue of automobile supplies and accessories of all kinds, including lamps, horns, tools, clothing, ignition apparatus and so on.

CHICAGO BATTERY CO., CHICAGO.—Catalogue of Duro dry storage batteries and electric lamps for automobiles; the lamps run from the smallest miniature lamp to the full-sized searchlight.

CHARLES E. MILLER, NEW YORK.—Large catalogue of automobile supplies and accessories of all kinds. A very complete and comprehensive book, which lists everything necessary and incidental to an automobilist's equipment.

MOTSINGER DEVICE MFG. CO., Pendleton, Ind.—Catalogue illustrating and describing the auto-sparker, an ignition dynamo for automobile, stationary or launch engines. The dynamo is fitted with a governor for maintaining constant speed.

IMPORTS AND EXPORTS.

Following is the official record of imports and exports of automobiles and parts of autos by the United States for the month of March, 1906, and for the nine months ending with March:

Imports.		Nine Mos. ending March, 1906.	
March, 1906.	No. Value.	March, 1906.	No. Value.
Automobiles	80 \$263,928	744 \$2,694,093	
Parts of autos	— 43,797	— 279,367	
	\$307,715		\$2,973,460
Exports by Countries.		Nine Mos. ending March, 1906.	
Country.	March, 1906.	March, 1906.	
United Kingdom	\$70,414	\$541,431	
France	16,035	139,226	
Germany	10,413	45,742	
Italy	40,418	171,628	
Other Europe	12,307	102,459	
British No. America	69,094	353,717	
Mexico	34,611	201,121	
W. Indies & Bermuda	9,996	220,434	
South America	3,991	52,032	
British East Indies	369	28,738	
British Australasia	10,774	129,620	
Other Asia and Oceania	9,857	40,767	
Africa	5,219	26,094	
Other countries	163	11,880	
Total	\$393,561		\$2,064,874

INFORMATION FOR BUYERS.

SPEED INDICATOR.—An attractive instrument combining a speed indicator, a trip odometer, a season or total odometer and a one-day clock all inclosed in a round bronze casing, is manufactured by the Acme Auto Meter Co., of 442 Water street, New York. The instrument is driven by flexible shaft from gearing attached to one of the front wheels of the car, and is fitted with a bracket for attachment to the dashboard. The bracket is pivoted, so that the dial can be set at any angle that the driver of the car finds most convenient. The speed-indicating scale occupies the upper semicircle of the dial and is marked in large, clear figures up to 65 miles an hour. Instead of pivoting the indicating hand in the middle of the dial in the usual way, the hand is pivoted inside the case, out of sight, but carries a pointer which is bent over the edge of the dial, moving in a slot, and so leaves the middle of the dial clear for other purposes. Partly in the semicircle and extending a little below it is the clock dial, also marked very plainly, with a seconds dial near the top. Below the clock are the odometers, the trip odometer reading to 999.9-10 miles and the total odometer reading to 9,999 miles. A knob is provided for setting the trip odometer back to zero. The Acme instruments are also made without the clock and without either clock or odometers; where the clock is omitted the hand or pointer is pivoted in the center of the dial in the usual way. The plain speed indicator can be made to register up to 130 miles an hour, for use on racing cars.

SPRING CHECK.—Everyone who has ridden in an automobile knows how unpleasant it is to be tossed in the air when the car goes over a "thank-you-ma'am" and to be met when half way down by the seat coming up again. And in addition to the discomfort caused the passengers, especially in the rear seats, these bumps are hard on the springs and the sudden and violent recoil frequently results in a broken leaf or leaves owing to the stress placed on the spring in the direction in which the spring is the least adapted to resist. One of the latest devices designed to obviate this undesirable spring action is the Toquet spring check, manufactured by B. Louis Toquet, of South Norwalk, Conn. This check consists of a drum, attached to the frame of the car, a band encircling the drum after the manner of a brake band, an arm extending from and formed integral with the band, and a connecting rod extending from the end of the arm to a bracket attached to the spring or axle. The connecting rod is attached at both ends by joints; the arrangement of the parts will be clearly seen in the illustration. The band encircling the drum is split at one side and the ends are drawn together by a spring arrangement, so that wear is automatically taken up and the stiffness of the check is practically constant. The brake band is lined with leather to give a smooth action. By tightening up the nut behind the spring the stiffness of the check can be adjusted to a nicety. One of the features of the de-



vice is that there is very little resistance to the compression of the spring on the downward movement of the car body, because the friction has a tendency to open up the gap in the brake band; but on the recoil or upward movement the tendency is to close up the gap, assisted by the coiled spring, and the checking action results. Two of these checks are usually fitted, one for each rear spring.

COMPLETE COMBUSTION.—With a view to producing complete combustion of the gasoline used in internal-combustion motors, and thus avoiding sooting of the plugs and cylinders and odorous exhaust, a substance called "No-Ko-Rode" has been placed on the market by the No-Ko-Rode Co., of 225 Dearborn street, Chicago. The manufacturers state that in addition to preventing the fouling of the engine and plugs, this compound increases the power developed by making the combustion complete.

INDEX TO ADVERTISERS

Acetylene Gas Illuminating Co.	31
Acme Motor Car Co.	35
Add-Wear Tire Sleeve Co.	56
Aerocar Co.	62
Am. Anti-Puncture Tire and Auto Co.	37
American Coil Co.	35
American Generator Co.	43
American Shock Absorber Co.	53
American Veneer Co.	41
Anderson Forge & Machine Co.	32
Arc Spark Mfg. Co.	55
Archer & Co.	27
Artizan Brass Co.	54
Ashton Valve Co.	30
Aster Co., L.	40
Auburn Automobile Co.	80
Auto and Power Appliance Co.	36
Auto Chimes Co.	77
Auto Instruct Publishing Co.	27
Auto Pump Co.	31
Auto Safety Starting Crank Works.	30
Auto Top and Equipment Co.	33
Automobile Equipment Co.	39
Automobile Supply Co.	31
Badger Brass Mfg. Co.	38
Baker Motor Vehicle Co.	79
Baldwin Chain Mfg. Co.	47
Barnett-Johnston Auto Supply Co.	33
Beaver Mfg. Co.	62
Bell, D. M.	71
Bemus, T. Alton.	32
Beverly Mfg. Co.	32
Blasler Mfg. Co., M. E.	33
Blomstrom Motor Co., C. H.	78
Blue Book	29-48-49
Boker & Co., H.	30
Borbein & Co., H. F.	36
Boston Mechanical Co.	31
Bowser & Co., S. F.	53
Boyle & Co., John.	54
Brennan Motor Co.	36
Bridgeport Vehicle Co.	33
Briscoe Mfg. Co.	32
Brown & Co., S. N.	33
Brown, R. E.	50
Brown, W. H.	77
Brownell-Trebert Co.	40
Buckeye Mfg. Co.	88
Bullard, J. H.	51
Buob & Scheu	33
Byrne-Kington Co.	73

C., B. & Q. Ry. Co.	39
Cadillac Motor Car Co.	86
Central Garage.	37
Chalfonte Hotel.	50
Champion Co., A.	31
Champion Mfg. Co.	31
Chase & Co., L. C.	43
Chelsea Clock Co.	Cover
Chicago, M. & St. P. Ry.	27
Clark, E. F.	46
Cleanola Co.	65
Cleveland Motor Car Co.	86
Coates Clipper Mfg. Co.	46
Collins & Sons, G. A.	33
Columbia Lubricants Co.	42
Connecticut Tel. & Electric Co.	30
Continental Caoutchouc Co.	67
Continental Motor Mfg. Co.	36
Cooper-Hewitt Electric Co.	46
Coops Co., C. W.	63
Corbin Motor Vehicle Corporation.	33
Covert Mfg. Co.	31
Crawford Automobile Co.	79
Cullman Wheel Co.	32
Cushing, J. M.	44
Dayton Electrical Mfg. Co.	76
Deere-Clark Motor Co.	77
Detroit Auto Vehicle Co.	83
Detroit & Buffalo Steamboat Co.	40
Diamond Chain & Mfg. Co.	32
Diamond Rubber Co.	70
Dietz, R. E.	51
Diezemann Shock Absorber.	76
Dixon Crucible Co., Joseph.	37
Domnick Co., Wm.	42
Dorris Motor Car Co.	80
Dover Stamping & Mfg. Co.	30
Dow Portable Electric Co.	38
Duff Mfg. Co.	55
Duplex Coil Co.	53
Duplex Ignition Co.	52
Duquesne Construction Co.	27
E. H. V. Co., The.	82
Eastern Carbon Works.	42
Edmunds & Jones Mfg. Co.	31
Edwards, J. H.	30
Eldredge Electric Mfg. Co.	30
Electric Rubber Mfg. Co.	37
Electric Vehicle Co.	80
Electrical Mfg. Co.	35
Elmore Mfg. Co.	91
English Daimler Co.	44
English & Mersick Co.	31
Erle Railway.	40
Excelsior Supply Co.	30
Fairmount Engineering Works.	27
Fedders Mfg. Co.	37
Firestone Tire and Rubber Co.	Cover

Ford Motor Co.	90
Forest City Motor Car Co.	79
Franklin Mfg. Co., H. H.	93
Franklin Portable Crane & Hoist Co.	55
G & J Tire Co.	Cover
Gabriel Horn Mfg. Co.	84
Garage Equipment Co.	30
Garford Co., The.	47
Gilbert Mfg. Co.	37
Goodrich Co., B. F.	70
Goodyear Tire & Rubber Co.	69
Gramlich Chemical Co.	31
Grand Hotel.	50
Gray-Hawley Mfg. Co.	32
Grout Bros. Automobile Co.	Cover
Haddon Hall.	65
Ham Mfg. Co.	57
Hardy Co., The R. E.	35
Harris Oil Co., A. W.	55
Harrison Wagon Co.	88
Hartford Rubber Works Co.	69
Hartford Suspension Co.	33
Hassler Co., O. C.	30
Hatcher Auto Parts Co.	43
Havemeyer Oil Co.	37-34
Hawkins Mfg. Co.	38
Haynes Automobile Co.	89
Healy Leather Tire Co.	68
Heise Electric Co.	61
Hicks Speed Indicator Co.	66
Hine-Watt Mfg. Co.	44
Hoffecker Speed and Mile Register Co.	51
Hoffman, George W.	31
Holley Bros. Co.	58
Holsman Automobile Co.	79
Hopewell Bros. Co.	37
Hotchkin, P. M.	73
Ideal Carriage Washer Co.	50
Illinois Central R. R.	41
Imperial Brass Mfg. Co.	42
Indianapolis Auto Top Co.	33
Iroquois Motor Car Co.	45
Jamesville Wheel Co.	39
Janney, Steinmetz & Co.	32
Jeffery & Co., Thomas B.	92
Jersey Brake Co.	43
Johnson Sporting Goods Co., Iver.	30
Jones Speedometer.	59
Kallish Air Brake Co.	38
Kent Mfg. Works, Atwater.	60
Kimball Tire Case Co.	38
King Mfg. & Garage Co.	33
Kirkman Motor Mfg. Co.	43
Knox Automobile Co.	85

Leavitt, Gilbert.....	31
Lipman, C. E.....	31
Lobe Pump Co.....	32
Locke & Co.....	47
Locomobile Co. of America, The.....	80
Logan Construction Co.....	81
London Auto Supply Co.....	33
Long Mfg. Co.....	56
Long & Mann Co.....	39
Loring, E. J.....	32
Lorier Motor Co.....	27
Lyon Utility Co.....	39

M. & M. Mfg. Co.....	35
Manhattan Lamp Works.....	57
Manhattan Storage Co.....	35
Manlove Gate Co.....	30
Manning Mfg. Co.....	31
Massey Machine Co.....	32
Matheson Motor Car Co.....	83
Maxwell-Briscoe Motor Co.....	91
McCord Mfg. Co.....	46
McDonald, Wessels & Ames Co.....	32
McKinney Removable Tire Holder.....	30
Merritt Co.....	33
Miami Pattern Works.....	31
Michelin Products Selling Co.....	58
Michigan Top Co.....	33
Midgley Mfg. Co.....	32
Miller, Charles E.....	67
Miller-Hopkins Mfg. Co.....	53
Milwaukee Rubber Works Co.....	41
Mitchell Motor Car Co.....	81
Moline Automobile Co.....	82
Monarch Mfg. Co.....	30
Monitor Speed Recorder Co.....	35
Moon Motor Car Co.....	90
Morgan, B.....	31
Morgan & Wright.....	68
Mosler & Co., A. R.....	30
Moss Photo Engraving Co.....	66
Motor Car Equipment Co.....	60
Motor Car Specialty Co.....	56
Motor & Mfg. Works Co.....	40
Mutty Co., L. J.....	33
Myers-Dayton Top Co.....	33

National Battery Co.....	47
National Brake & Clutch Co.....	74
National Carbon Co.....	47
National India Rubber Co.....	38
National Motor Vehicle Co.....	92
National Tank Co.....	26
Neustadt Auto & Supply Co.....	54
Never-Miss Spark Plug Co.....	35
Newmastic Tire Co.....	37
New England Motor Co.....	35
New Jersey Tube Co.....	31
New Process Rawhide Co.....	39
New York Sporting Goods Co.....	40
Nicholsberg Mfg. Co.....	36
No-Ko-Rode.....	75
Nordyke & Marmon Co.....	82
Normandie Hotel.....	50
Northern Mfg. Co.....	62
Northwestern Railway.....	65
Nuttall Co., R. D.....	32

Oakes & Dow.....	cover
Ofeldt & Sons.....	31
Olds Motor Works.....	64

Pacific Tucking & Mfg. Co.....	30
Packard Electric Co.....	35
Parish & Bingham Co.....	32
Paul & Co., J. C.....	38
Pedersen, J. T.....	32
Pennsylvania Petroleum Co.....	72
Philadelphia Grease Mfg. Co.....	30
Philadelphia Ornamental Wire Co.....	38
Pigot, Sayre & Co.....	20
Pioneer Brass Works.....	32
Pope Mfg. Co.....	85
Post & Lester Co.....	45
Prest-o-Lite Co.....	57

Railway Appliances Co.....	30
Raines & Co.....	46
Rainier Co., The.....	45
Randall-Falchney Co.....	31
Remy Electric Co.....	87
Robert Instrument Co.....	39
Rochester Automobile Co.....	31
Royal Battery Co.....	66
Royal Equipment Co.....	31
Royal Motor Car Co.....	81
Rubay, Leon.....	Cover
Rushmore Dynamo Works.....	56-57

Sailman Co., John A.....	27
Samson Leather Tire Co.....	35
Shaw, Ora D.....	33
Shawver Mfg. Co.....	32
Sheddan Mfg. Co.....	67
Sibley & Pittman.....	27
Skinner & Skinner.....	37
Smith Automobile Co.....	82
Smith Co., A. O.....	54
Smith & Co., D. B.....	31
Smith & Mabley.....	95
Smith Mfg. Co., R. H.....	44
Speed Changing Pulley Co.....	31
Spicer Universal Joint Mfg. Co.....	67
Splittorf, C. F.....	35
Sprague Umbrella Co.....	46
Springfield Hat & Cap Co.....	39
Springfield Metal Body Co.....	33
Springfield Moulding Works.....	33
St. Anne Kerosene Motor Co.....	87
St. Louis Motor Car Co.....	41
Standard Brake Co.....	71
Standard Roller Bearing Co.....	32
Stanley, John T.....	75
Stearns Co., F. B.....	94
Steel Ball Co.....	32
Stevens Arms & Tool Co.....	89
Stitch-in-Time Vulcanizer Co.....	39
Streit Machine Co., A.....	36
Suffolk Chemical Co.....	36
Syracuse Aluminum & Bronze Co.....	32

Teel Mfg. Co.....	68
Thomas Motor Co., E. R.....	61
Thompson, J. P., Sons Co.....	35
Tiley-Pratt Co.....	44
Times Square Auto Co.....	27
Timken Roller Bearing Axle Co.....	73
Toquet, B. Louis.....	41
Trebert Gas Engine Co.....	42
Tucker, C. F.....	30

Ultra Pump & Power Co.....	31
Uncas Specialty Co.....	42
Underwood Typewriter Co.....	41

Valvoline Oil Co.....	45
Veeder Mfg. Co.....	45
Vestal Shock Absorber Co.....	66

Walker Co., E. C.....	43
Walker & Co., Geo. H.....	30
Wallwork Tire Covers.....	43
Waltham Mfg. Co.....	27
Warner Instrument Co.....	62
Warner Pole & Top Co.....	33
Way Muffler Co.....	83
Weber Co., O. F.....	27
Webster Mfg. Co.....	74
Webster Mfg. Co.....	39
Welch Motor Car Co.....	38
Western Oil Pump Co.....	32
Western Tool Works.....	81
Weston Electrical Instrument Co.....	36
Wheeler & Schebler.....	44
White Sewing Machine Co.....	84
Whitney Mfg. Co.....	36
Winship, W. W.....	37
Winton Motor Carriage Co.....	96
Witherbee Igniter Co.....	35

York Hotel.....	65
Zenith Novelty Works.....	42

SPECIAL NOTICES

Advertisements inserted under this heading at 20 cents per line; about 7 words make a line. Remittance should accompany copy. Replies forwarded if postage is furnished.

AUTOMOBILES—\$135 up. The best assortment we have ever had. We can positively save you money. The Starin Company, 72-74 Main St., North Tonawanda, N. Y. May 31

A RARE OPPORTUNITY—Double side entrance Peerless with top and glass front, five lamps, Gabriel horn, etc., will be sold cheap, or will give you good trade for your smaller car. The Starin Company, 72-74 Main St., North Tonawanda, N. Y. May 31

CHAUFFEUR—American, young, single, neat, thoroughly temperate, wishes situation; touring preferred. Box 51, Paris, Me. May 31

CHAUFFEUR—A technical student wishes position as chauffeur during summer vacation; two years' experience in repairing and on the road. Private family preferred. Worcester, care The Automobile. May 31

DRAUGHTSMAN—German graduate as engineer; experienced on automobiles, desires position with prospect for advancement. Loewenson, 254 East 68th St., New York City. May 31

ELMORE, 1905—We have at present three 1905 Elmore touring cars, 16-h.p., which we will dispose of at a very low figure to accommodate purchasers of 1906 machines. Elmore Automobile Company, 1851 Broadway, New York. L.F.

FOR SALE—1904 Haynes touring runabout, fine condition; \$450. Wm. Meade 8th, Petersburg, Va. May 31

FOR SALE—15-tube radiator, \$10; 24-tube, \$15. A. M. Symonds, 901 No. Fairfield Ave., Chicago, Ill. L.F.

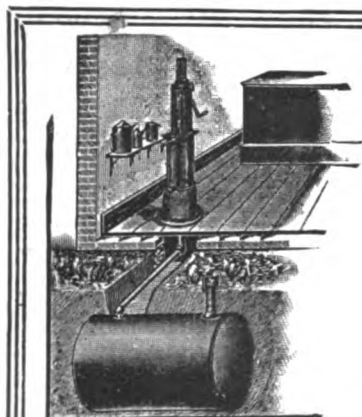
FOR SALE—Bargain. Running gear, with tires; two oil lamps, one muffler, one carburetor. 912 Raspberry St., Erie, Pa. May 31

FOR SALE—National electric runabout, with new oxide battery. Tires extra heavy. Northern Mfg. Co., Detroit. June 1

FOR SALE—Flywheel and disconnecting clutch for 1903 or 1904 White touring car. Portland Garage, Portland, Me. L.F.

FOR SALE—30-h.p. Walter Car, in perfect condition; reason for selling, have purchased larger car. Address Chas. Osgood, M.D., 58 Central Park West, New York City. May 31

FOR SALE—16 passenger gasoline car; 4-cylinder 50-h.p. motor; top; storm front; full equipment. Used five months; cost \$4,000. Will sell for \$2,500. Guaranteed perfect order. For complete specifications address Opportunity, care The Automobile. June 21



THE NATIONAL GASOLINE TANKS

☞ The National Long Distance Gasoline Storage Outfit, which permits of placing the supply tank under ground, the pump being inside the building. In perfecting this outfit we have observed to the letter the rules of the Underwriters' Laboratories, and can recommend it to be the safest and most economical way of handling gasoline ever devised. ☞ This pump is one of our latest, Double Cylinder, which in operating there is no lost motion, every movement of the handle pumps and measures oil, saving time, labor and money. ☞ This outfit is especially designed for Automobile Garages. ☞ Ask for Catalogue.

THE NATIONAL TANK CO., Inc., DAYTON, OHIO

THE AUTOMOBILE

VOL. XIV.

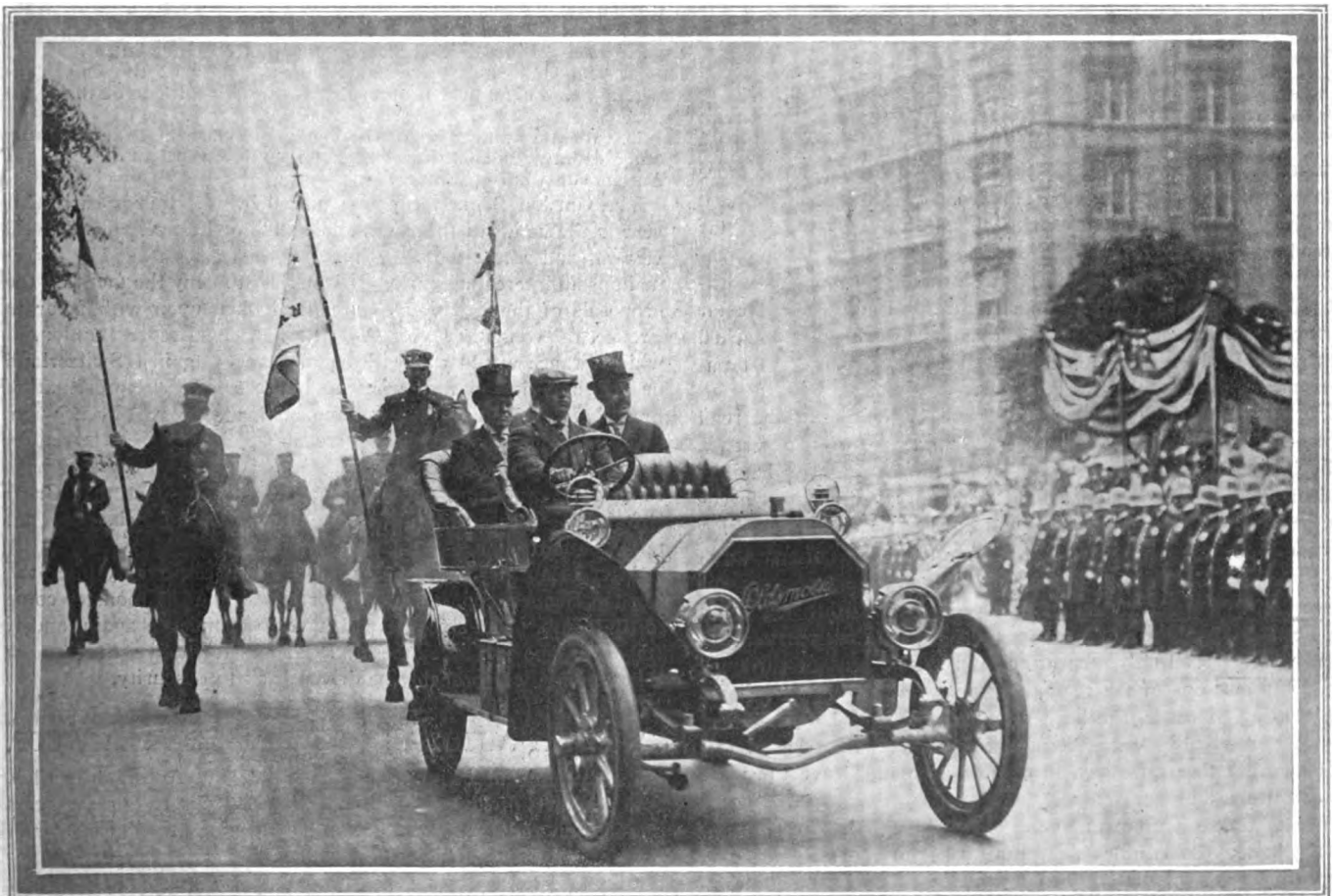
NEW YORK—THURSDAY, JUNE 7, 1906—CHICAGO

No. 23

ESSENTIAL AUTOMOBILE AND CITY OFFICIALDOM

Nowadays the automobile is an essential and prominent feature of every public function, the motor-driven vehicle serving as the conveyance of the notables of the occasion. Only recently President Roosevelt, whose enthusiasm for automobiling had been of a decidedly indifferent character, was seen in a car at the Paul Jones ceremonies at Annapolis. In many cities the heads of departments now require automobiles to facilitate their labors, and nowhere is this more general than in New York City, which o'erspreads the territory above The Bronx, includes a substantial portion of eastern Long Island, and also embraces Staten Island.

Mayor McClellan drives his own car and uses it on all occasions. Police Commissioner Bingham is a recent convert, and in company with the Mayor on Saturday last he was met at his hotel by Ernest Keeler, who will pilot the Oldsmobile racer in the Vanderbilt Cup event, and the two were conveyed under special escort of a platoon of police to the reviewing stand in Madison Square. The photograph is an excellent one, the Mayor being on the left, in the tonneau, and the Police Commissioner on the right. Usually the Mayor is at the wheel, but on this occasion he is compelled to figure only as a passenger.



MAYOR M'CLELLAN AND POLICE COMMISSIONER BINGHAM EN ROUTE TO REVIEWING STAND FOR THE POLICE PARADE.

TO TAR GRAND PRIX COURSE.

PARIS, May 18.—As the date of the Grand Prix draws nearer activity increases on the part of the committee, the teams and inhabitants of the district of the Sarthe. Several changes have had to be made in the list of drivers. Thus M. Civelli de Bosch will replace Renovié on the second Grégoire car, and the Mercedes team, after undergoing many changes, has finally been fixed as follows: Jenatzy, Mariaux, and Chevalier Florio. Braun, who had at one time been looked upon as a driver, will act as mechanic to the Italian champion. Mariaux first came into public notice last year on the Brescia circuit, and won some local popularity by a series of wild early morning dashes from Paris to the seacoast last summer.

Owing to the inability of the firm to complete the new six-cylinder Mercedes racer in time to be properly tuned up for the big race, it has been decided not to run them in the Grand Prix, but to fall back on last year's machines. C. L. Charley, who has all the arrangements in hand for the race, is now obtaining possession of the 120-horsepower four-cylinder racers of last year, Mr. Graver's machine, with which Jenatzy ran in the Vanderbilt Cup race, being already on its way across the Atlantic. This is not the first time the Mercedes people have run a previous year's model, the same thing occurring in the Gordon Bennett race in Ireland.

The hour of starting has been fixed at 6 A. M., with an interval of ninety seconds between each car. As there are 34 competitors, starting operations will occupy 49 minutes 30 seconds, leaving but a short interval between the departure of the last car on the first and the commencement of the first car on the second round.

The starting point and headquarters of the Automobile Club of France and the Automobile Club of the Sarthe have been fixed on the western leg of the circuit at a point known as the Pelle Mutile, near the railway station of Pont de Gennes, distance eleven miles from Le Mans by road, and twenty minutes by rail, there being a good train service along the entire leg of the circuit. On the right will be erected the grandstand and on the left will be erected a garage for competitors.

Tarring of the road has already been commenced, as well as the construction of the plank road across the angle of the circuit at St. Calais. Last year the oiling of the road on the Auvergne circuit did not give the satisfactory results expected and a more elaborate process is now being adopted. The road is first swept thoroughly by means of mechanical brushes, and the hot tar spread on a width of eighteen feet by means of a tarring machine which is accompanied by a tar furnace. A gang of workmen then spread the dust obtained by the sweeping over the tar surface, brushing it in so that it remains permanently attached to the road. It is expected that the tarring will be a vast improvement over the oiling of last year.

For about one-fifth of the total length of the circuit the road will be enclosed by wooden barriers. These are of two sorts, a solid barrier about 50 inches high in all the villages and hamlets and at all cross roads, and a light fence at other portions needing protection. Not much work will have to be done in banking up the road, for altogether there are only about fifteen turns on the entire circuit, and several of these are gentle curves not necessitating a great reduction of speed. The eastern leg, from La Ferté-Bernard to St. Calais, is the most winding portion, but even here the road only serpentine and has no brusque turnings. On many portions of the road there is a wide grass plot left for the grazing of cattle, the limit of which is marked by a line of stones at intervals. It has been decided to level the edge of this plot in order that cars may, in case of necessity, leave the main road entirely.

The official measurement of the circuit gives the total distance as 103 k. 180 (80.89 miles), the three sides of the triangle being respectively 33 kilometers (20.50 miles), 34.130 (21.20 miles), 34.806 kilometers (21.62 miles), and the plank roads across an angle of the circuit, 1 k. 244 m. 772 of a mile.

ONCE MORE THE GORDON BENNETT.

PARIS, May 24.—The wordy battle in which the whole motor world was engaged last year is about to recommence. It will be remembered that after weeks of skirmishing and not a little hard fighting the Gordon Bennett question was settled by the abandonment of the race for 1906 and the promise of a conference in June to decide what future action should be taken. The meeting has just been fixed at the request of the Automobile Club of Great Britain and Ireland, for June 25, at the stand of the Automobile Club of France, at Pont de Gennes, on the Sarthe circuit, all recognized clubs to be represented.

The British propositions are:

1. That the Gordon Bennett Cup shall continue to be a speed race. (It is universally recognized that speed tests have brought the ordinary car to its present state of utility.)
2. The number of automobiles representing each national club shall be there. (The Gordon Bennett Cup having been created as an inter-club contest, all clubs ought to have an equal chance.)
3. The length of the circuit shall be approximately 50 kilometers (31 miles), and the total length of the course 500 kilometers (310 miles). (The shorter a circuit the more spectacular interest is created, and the expenses of organization are proportionally decreased.)
4. Machines must not weigh more than 850 kilos (1,870 pounds). Each machine must carry 150 kilos (330 pounds) of ballast, which must not in any case form part of the structure of the car. (The Automobile Club of Great Britain considers that the above-mentioned distribution of weight will do more to perfect the touring machine than a limit of 1,000 kilos, as at present existing.)
5. The entry fee will be \$600 for the present, and no club other than that of the country in which the race is held will have to contribute any other sum than this \$600 to the expenses of the race. (If the number 3 is adopted, the expenses of organization, etc., of the race will be materially diminished.)
6. The cars shall be driven by members of the clubs taking part.
7. Entries will close on December 31 of the year preceding the race.
8. The race will take place in May or June.
9. The conditions regulating the weight other than the weight of the vehicles and the ballast will remain the same as in the present regulations.
10. The machines shall be entirely constructed and all their parts manufactured in the country which they represent.
11. No club shall become permanent holder of the cup. The winning club shall hold it according to the stipulations of the regulations.
12. Whether the race for the cup takes place in France or any other country, it shall always be run under the regulations of the Automobile Club of France.

The Gordon Bennett cup was placed by M. Brasier early this year in the hands of the Automobile Club of France, where it still remains and where the native club had hoped it would always remain as an interesting curio. It is useless to deny the fact that the proposals of the British club are not looked upon with favor in France, the contention here being that an equal representation, in which France would run with equal chances against Switzerland or Belgium, is too dangerous to be accepted. "Representation must be based on productive importance," say the Frenchmen. "We, with our score of big constructors, cannot consent to run on equal terms with smaller powers only possessing one or two firms capable of producing a racing machine." The fact that Great Britain has refused to run in the French Grand Prix does not tend to an acceptance of the new proposals.

After being at so much pains to kill and respectably inter the Gordon Bennett cup, it is disconcerting to find the monster come to life again. The struggle will have to commence again, and if Italy will give to France the aid she hopes to receive, the Gordon Bennett Cup will probably be driven back to obscurity.

CAPE MAY AUTOISTS AFTER VANDERBILT CUP.

Two prominent members of the Cape May Automobile Club, both residents of Philadelphia, and both of whom have driven cars in races on the Cape May beach, have decided to enter a car in the Vanderbilt Cup elimination trials which take place in September next. The newcomers in the realm of big races are Charles J. Swayne and Dr. J. N. Wilkins. Both have driven gasoline machines, but their new racer will be a Stanley steamer.

CATECHISM OF THE GASOLINE AUTOMOBILE*—I

By FORREST R. JONES, M.E.

Q.—WHAT is a cycle with reference to an internal combustion engine?

A.—A series of events occurring in regular order through which the engine and its auxiliary apparatus passes repeatedly when in operation.

Q.—What is a four-stroke cycle (usually called four-cycle) engine?

A.—An internal combustion engine in which the complete cycle (series of events) occurs during four successive strokes of the piston.

Q.—Give the events that occur in a four-stroke gasoline engine in the order of their occurrence.

A. (Any part of the cycle may be taken as the starting point. It is convenient to begin with the stroke that draws in the combustible mixture.)

First stroke: Intake or admission stroke. The piston starts from its extreme position next the combustion chamber (from the highest position in a vertical cylinder engine) and the inlet valve is opened either by suction (automatic valve) or by the inlet cam (mechanical valve) at about the same time so as to allow the combustible mixture (charge) to be drawn in by suction until the end of the stroke. The inlet valve closes at (or about) the end of the intake stroke.

Second stroke: Compression stroke. Both valves are closed. The piston moving toward the closed end of the cylinder (combustion chamber) compresses the charge to a pressure of about 65 pounds per square inch.

Third stroke: Impulse, working, expansion or driving stroke. Includes ignition, inflammation, combustion and expansion of charge. The electric spark or other ignition device ignites the charge about the time the piston has completed compression, and combustion (following inflammation) takes place more or less rapidly. The gas pressure is increased by the heat of combustion (to 350 pounds per square inch or less) and drives the piston out from the closed end of the cylinder. The expansion and cooling of the products of combustion lower the pressure as the piston moves out. Shortly before the end of the stroke the exhaust valve is opened by the exhaust cam (the exhaust valve is always opened by a cam or other device positive in its action). The gases escape rapidly with a characteristic puff until the pressure falls to about that of the atmosphere (to nearly zero pressure by gauge).

Fourth stroke: Exhaust or eduction stroke. The piston moving toward the closed end of the cylinder expels more of the remaining gases through the open exhaust port. The exhaust valve is held off its seat until (or after) the end of the stroke. This completes the cycle. It is begun again with the next stroke.

Q.—Give the events that occur in a two-stroke cycle (usually called two-cycle) engine in the order of their occurrence.

A.—As a convenient method for a beginning, it will be assumed that there is a compressed charge in the combustion chamber, and the piston in its position nearest the combustion chamber. When a charge is fired, the piston is driven out on the impulse stroke by the pressure caused by the combustion until the stroke has been nearly completed. A number of small port holes arranged circumferentially around the cylinder walls and previously covered by the piston are then uncovered by its motion. The gases in the cylinder still being under considerable pressure rush out through these

openings which form the exhaust port. Still further motion of the piston on the impulse stroke uncovers another row of port holes circumferentially arranged which connect with the crank chamber. When the piston starts on the impulse stroke the crank chamber is filled with a combustible mixture at about atmospheric pressure. The impulse stroke compresses this mixture, so that when the inlet ports—just referred to as being uncovered by the piston—are open, a charge passes from the crank chamber to the cylinder and combustion chamber. The next stroke (up-stroke in a vertical engine, in-stroke in a horizontal engine) of the engine closes first the inlet port, then the exhaust port, and finally compresses the charge in the cylinder. On the compression stroke, mixture is drawn into the crank chamber. This completes all the operations related to the cycle. As the name indicates, the complete cycle occurs in two strokes of the piston, corresponding to one revolution of the crankshaft.

Q.—Does the gasoline engine main shaft reverse its direction of rotation when the car changes from forward to backward motion?

A.—No. The change speed and reverse gears provide for this.

Q.—Will a four-stroke cycle engine run its main shaft in either direction?

A.—No. Except in very unusual designs.

Q.—Can a two-stroke cycle engine be run in either direction?

A.—Yes. By moving the timer to ignite properly, it will run equally well in either direction of rotation—clockwise or counter clockwise.

Q.—How are the cylinders placed in a two-cylinder opposed engine?

A.—On opposite sides of the crankshaft.

Q.—How do the pistons move in a two-cylinder opposed (horizontal) engine?

A.—They move toward each other during one-half revolution of the crank and both recede during the remaining half revolution.

Q.—How is compression produced in the crank chamber of a two-cylinder opposed engine?

A.—By the motion of the pistons toward each other.

Q.—How do the pistons move in relation to each other in a four-cylinder vertical engine of the four-stroke cycle type?

A.—The front and rear pistons move upward together at the same time that the intermediate ones move down together. This is the usual construction.

Q.—In what order are the successive charges exploded in a four-cylinder, four-stroke cycle, vertical engine whose pistons move as just described?

A.—Starting with the front cylinder they come in the following order: (1) Front cylinder; (2) one of the intermediate cylinders; (3) rear cylinder; (4) remaining intermediate cylinder.

Q.—What is a carbureter?

A.—An apparatus for enriching air with fuel hydrocarbon such as gasoline, naphtha, kerosene, alcohol, etc.

Q.—What types of carbureters are most commonly used?

A.—Float feed, disk feed and diaphragm feed.

Q.—Describe a float-feed carbureter.

A.—It has a small reservoir into which the liquid fuel flows through pipe connections from a tank. When the fuel reaches a certain height a cork or hollow metal float closes a valve which stops the flow. From the reservoir a small

*Adopted for class instruction in the Manhattan Automobile School, for owners and mechanics, New York. Copyright 1906, by the Class Journal Company. All rights reserved.

opening leads through a pipe (or hole in the casting) to a large tube or opening through which air passes. The upper end of the pipe is slightly higher (1-16 to 1-8 inch) than the level of the liquid maintained by the float. At the end of the pipe is a minute opening (nozzle) for the escape of the liquid. When a current of air is drawn through the air passage the suction draws the liquid fuel (gasoline) out of the nozzle.

When gasoline is thus drawn out it quickly vaporizes and the vapor mixes with the air and forms a combustible mixture when the proportions of air and gasoline are correct. When the gasoline is drawn out, the float descends with the lowered supply in the carbureter reservoir and more gasoline flows in from the tank till the float valve again shuts it off. A small valve with a conical point and threaded stem, called a needle valve, is adjustable in the opening from the carbureter reservoir to the air passage to regulate the quantity of gasoline drawn out by the air.

One or more throttle valves are placed in the air passage to control the amount of air passing through when the carbureter is used in connection with an internal combustion engine. Some carbureters have more than one gasoline outlet; a small one which operates when the air throttle is nearly closed and only a small amount of air is passing through, and a large nozzle which alone supplies gasoline when the air throttle is opened to a considerable extent. Each opening has its own needle valve.

A spring valve is often used to nearly close the air inlet to the carbureter when resting on the valve seat, but a small bypass is always left open. This air valve remains on its seat when the throttle is nearly closed, and all the air comes in through the bypass. But when the throttle is opened, the suction lifts the air valve from its seat, thus securing a sufficiently large passage. The tension of the air-valve spring is adjustable to regulate the extent of the partial vacuum caused by suction and thus the amount of gasoline drawn out to enrich the air.

The air current in some designs passes by the nozzle in the direction of its opening, in others in the reverse direction, and in some at right angles to the nozzle.

Q.—Describe a disk-feed carbureter.

A.—In the disk-feed carbureter the air is drawn through a large passageway in which is a minute opening that terminates the gasoline feed pipe that leads from the tank. This opening is closed by a needle valve which has a disk of very thin sheet metal attached to the stem. When no air is passing through the carbureter the needle valve closes the gasoline nozzle. As soon as air is drawn through, the current striking against the disk lifts it from its seat. Gravity and suction then both bring gasoline out of the nozzle to mix with the air. The lift of the valve and its disk are controlled by an adjustable screw which regulates the extent of the movement. Sometimes a spring is used to hold the disk down and this valve to its seat and also regulate the amount of opening due to suction.

Q.—Describe a diaphragm-feed carbureter.

A.—In this type the air is drawn through a large passageway as in the types just described. The reduction of air pressure causes action on a diaphragm supported at its circumference and free to move at the center. The needle valve for controlling the outlet of gasoline is held to its seat when no air is passing. As soon as air is drawn through, the pressure is reduced on one side of the diaphragm, which causes its center to move. The needle valve is attached to its center and the motion of the diaphragm lifts the valve from its seat to allow gasoline to flow either by gravity or suction, or both.

During the month of April, 1906, there were imported into the United States 144 automobiles of a total value of \$421,268. The imports for the ten months ending with April, 1906, were 888 cars, valued at \$3,115,361.

PHILADELPHIA'S MANY NEW 'BUS LINES.

PHILADELPHIA, June 4.—The People's Vehicle Company, which last week caused to be introduced into City Councils an ordinance granting it numerous privileges as to the streets upon which it asked the right to operate automobile 'buses, has run up against a snag. Not only the Philadelphia Rapid Transit Company, but the recently organized Auto Transit Company, have filed remonstrances against the wholesale franchise which the People's Company asks for. That corporation asks for the right not only to operate its 'buses the entire length of Broad street and on Diamond street from Broad street to Fairmount Park—the very territory for which the Auto Transit Company has obtained permission to occupy—but also wants the privilege of running on Market street from Broad street to the Delaware ferries; on Delaware avenue from Callowhill to Dock; on Dock street to Third; on Third to Market; Diamond street, from Front to Broad; Hunting Park avenue, from Broad to Hunting Park; and on Fortieth street, Forty-fourth street, Lancaster avenue and other approaches to West Fairmount Park.

The ordinance has been turned over to City Solicitor Kinsey before action is taken, and Director Hicks, of the Department of Public Works, has been asked to pass upon it. It is understood that if Messrs. Kinsey and Hicks pass upon it favorably the Highway Committee will favorably recommend it.

The People's Company has made a bid for public favor by its offer to charge school children, between certain hours only, two cents for fare instead of the regular five cents; to sell six tickets for 25 cents, or twenty-five for \$1.

None of the promoters seems to have any definite idea as to the size, power, or make of the 'buses which it is proposed to operate; certainly the company will not be in a position to begin operations for many months to come. For these reasons it has been asserted that the ordinance is merely an effort to secure franchises which may be sold at a profit at some future time.

MANY WOMEN DRIVERS IN ROCHESTER, N. Y.

ROCHESTER, N. Y., June 4.—A. L. Westgard, an old resident of this city, and here for the first time in nearly two years, comments upon the growth of the automobile industry thusly:

"The great popularity of automobiling in Rochester is very apparent to a visitor who has not been here for some time. I am told that there are over 1,200 automobiles in Rochester, and one thing that strikes me particularly is the large number of women running their own cars. To-day I have counted in two hours thirty-two women drivers, about one-third of whom had gasoline cars, the majority using electric runabouts."

Rochester's Labor Day race over the 25½ mile course should be very successful. The distance will be 102 miles, or four times around the circuit, the route of which is mostly macadam and a few poor spots will be improved. The consents of property owners have been nearly all secured.

CONCERNING NEW FREE ALCOHOL LAW.

WASHINGTON, D. C., June 2.—The interesting announcement was made at the White House to-day that President Roosevelt has directed Commissioner of Internal Revenue Yerkes to proceed to Europe to fully investigate the operations of the laws of the various countries as to denatured alcohol. The Commissioner will leave shortly and will be away several months. The diplomatic and consular officers of this country will aid him during his investigations.

The free alcohol bill recently passed by Congress provides for regulations to be made by the Commissioner of Internal Revenue. Much depends on how these regulations are made, as to whether denatured alcohol becomes cheap enough for power purposes, or not. The object of Commissioner Yerkes' trip is to carefully study the foreign laws and their effects.

STEARNS AGAIN WINS CLEVELAND CLIMB

By GEORGE F. DAVIS.

CLEVELAND, June 5.—Frank B. Stearns has demonstrated that he is one of the most daring hill drivers in this part of the country. In last year's contest of the Cleveland Automobile Club at Gates Mills he easily vanquished all competitors. This year, with the keen competition and remarkable performances of other skilled drivers, he twice clipped seconds from the performances of others who looked like sure winners.

The contest this year was managed in a businesslike way. The hill was smoothed off and bad places oiled, so that it was in prime condition; the course was accurately surveyed for a full mile, and the timing was done by signal bells and telephone, so there can be no question as to the authenticity of the work. The best time, 1:23 2-5, was almost four seconds slower than last year, but the course was one-tenth of a mile longer, so that in reality the winner did much better than last year.

Only recently recovered from a terrible accident which nearly cost him his life and laid him up for many weeks, Mr. Stearns said before starting that he felt he was out of the contest. After winning event No. 12 in 1:24 4-5, he came back to the tape, weak from the effort, and said: "I will never, never go up that hill again in a race." Ten minutes later he changed his mind, and in the next event clipped a second and a half from his previous time.

The hill is long and crooked, with three bad turns, two of which tried the nerves of the best of them. W. D. Drown, with a huge 90-horsepower special car which he had built himself, was looked upon as a likely winner, but in his first trial he failed to negotiate a turn and went over a bank, capsizing the machine and wrecking two wheels, but without injury to himself or machinist.

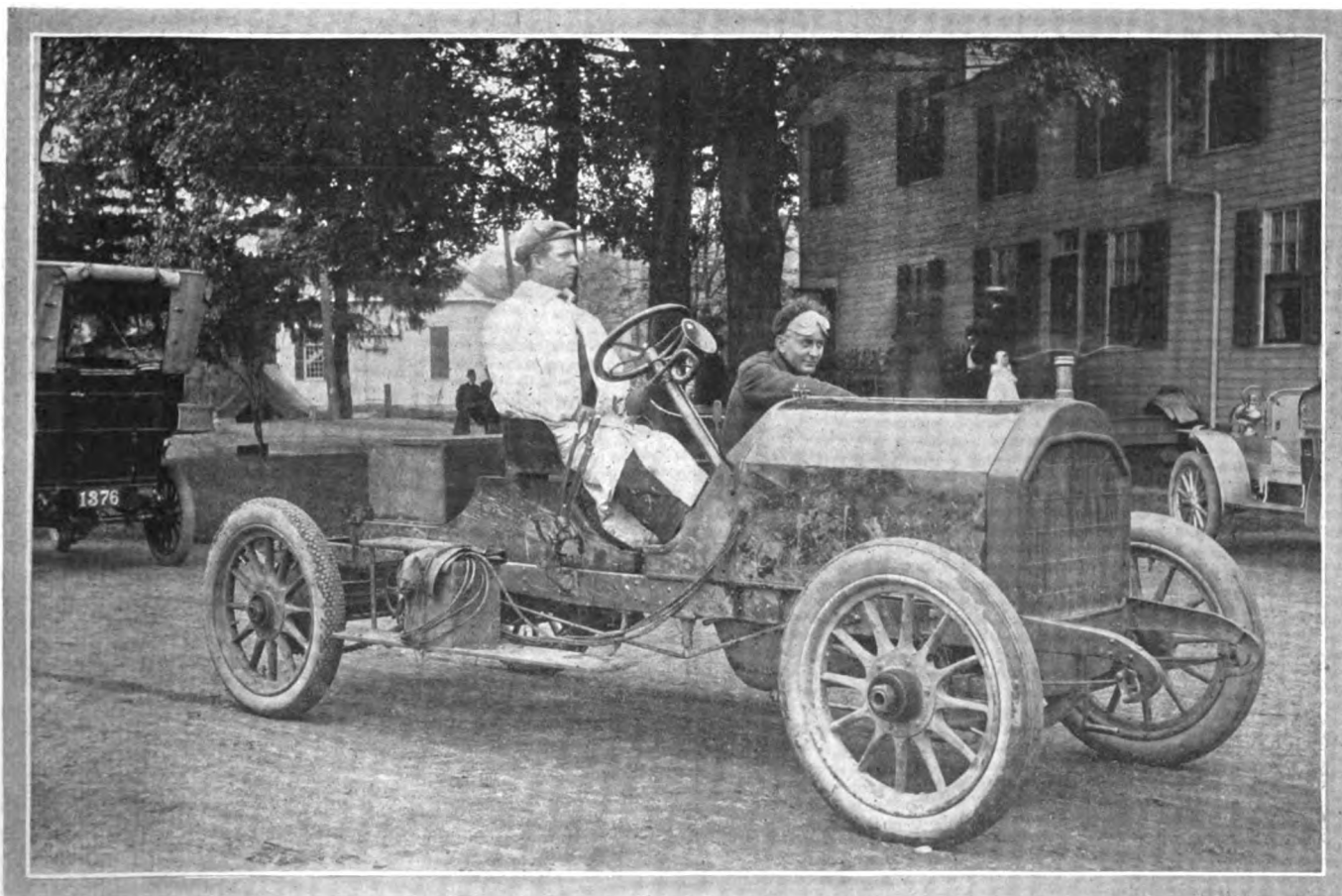
Although Mr. Stearns was able to carry off first honors in three

events, he was pushed closely by Arthur Scaife and Walter White, driving White steamers. Mr. White got one event in a stock car of the 1906 pattern, while Mr. Scaife drove a little old 10-horsepower machine of the vintage of '03, running twice second to Stearns. The little machine pitched and swerved on the rough turns, and seemed almost certain to go to pieces on the uneven plank road, which constituted the finishing stretch.

A Reo, driven first by M. C. McInnes and later by E. R. Thomas, captured three firsts, one of them in an event ahead of its class. McInnes was protested and disqualified for being a professional chauffeur, the events in question being open to amateur drivers. The amateur championship of Cuyahoga county by this default went to C. W. Ferguson, whose time, 2:15, was but 1-5 of a second less than that of McInnes.

A decided innovation was sprung by the appearance of Mrs. J. C. Simons, the first woman to drive in an automobile race in Cleveland. She was able to take second place in the fourth event, finishing slightly behind McInnes, who was later disqualified, giving Mrs. Simons a beautiful silver cup for her china closet.

Rain during the morning kept away many spectators and some of the contestants, but for all that there was a big array of automobiles, with many people who came on the electric line, augmented by hundreds of farmers who were anxious to see what the new-fangled machines could do on a grade that has long been the terror of the country horses of that district. The little village never saw so many people, and the quaint little country hotel, where good old-fashioned chicken dinners are served at the most up-to-date city prices, was eaten out of house and home, and many a fair society lady, not to mention the officials who were marooned



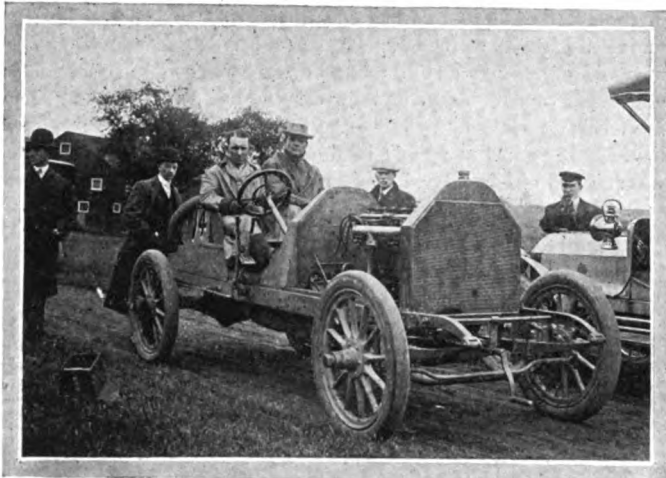
FRANK B. STEARNS IN STEARNS CAR THAT MADE FASTEST TIME AND WON THREE PRIZES AT GATES MILLS HILL CLIMB.



R. J. C. SIMONS AND THE JACKSON CLIMBER.

up at the top of the hill, was glad to relieve an empty feeling caused by a session that was almost an all day affair with cheese and crackers purchased at the country grocery. The summary:

Owing to the fact that the output of Stearns cars is limited, and the builders find it difficult to turn out enough to supply



W. D. DROWN IN 90-H.P. SPECIAL THAT WAS WRECKED.

the demand, the Stearns cars are seldom entered in contests, owing to lack of time. The car has always given a good account of itself, however, when opportunity has offered. A Stearns car won the climb on the same hill a year ago, making time that was record then; the course was a tenth of a mile shorter than this

year's course. The road was very muddy at first, but it improved as the contests proceeded, this having a beneficial effect on the times, as the record trip of the Stearns indicates. Had the road not been given careful attention before the contests, no such time could have been made.

Summary of the Gates' Mills Hill Climb.

AMATEUR CHAMPIONSHIP OF CUYAHOGA COUNTY.

1. Pope-Toledo, C. W. Ferguson	2.15
2. Stoddard-Dayton, T. J. Wetzel	2.27
3. Royal, C. Emmerman	3.06

STOCK CARS, PRICE \$850 TO \$1,500.

1. Reo, E. R. Thomas	2.17
2. Bulck, W. L. Marr	2.19 2-5
3. Bulck, A. Whittle	2.27
4. Stoddard-Dayton, H. B. Odell	2.38 2-5
5. Bulck, Harry Page	2.50 1-5
6. Jackson, Louis Schmidt	2.58 2-5

STOCK CARS, \$850 TO \$1,500, AMATEUR OWNERS.

1. Reo, M. C. McInnes	2.08
2. Jackson, Mrs. J. C. Simons	2.22 2-5
3. Bulck, W. H. Jenner	2.38 1-5

STOCK CARS BETWEEN \$1,500 AND \$2,000.

1. White, Arthur Scaife	1.52 1-5
2. Franklin, E. M. Springsteen	2.58
3. Franklin, C. Taylor	3.12 4-5

STOCK CARS, PRICE \$2,000 TO \$3,000.

1. White, Walter C. White	1.44
2. Jackson, Louis Schmidt	1.50 2-5
3. Stoddard-Dayton, R. H. Croninger	2.05
4. Stoddard-Dayton, H. S. Moore	2.19 4-5
5. Franklin, G. F. Johnson	2.42

STOCK CARS, PRICE \$3,000 TO \$5,000.

1. Stearns, F. B. Stearns	1.40 1-5
2. Pope-Toledo, R. H. Magoon	2.04
3. Stearns, L. Petrie	2.17
4. Thomas, P. M. Owen	2.19
5. Pope-Toledo, Geo. Soules	2.35 2-5

STOCK CARS, \$3,000 TO \$5,000.

1. Thomas, R. M. Owen	2.15 2-5
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CLASS B, CARS FROM 861 TO 1,432 POUNDS.

1. Stoddard-Dayton, Frank Adams	1.44 2-5
2. Reo, E. R. Thomas	1.59
3. Stoddard-Dayton, H. B. Odell	2.35 2-5
4. Franklin, W. S. Schroder	3.09

CLASS A, CARS FROM 1,432 TO 2,204 POUNDS.

1. Stearns, F. R. Stearns	1.24 4-5
2. White, A. C. Scaife	1.25 1-5
3. White, W. C. White	1.41
4. Stearns Stoddard-Dayton, F. Adams	1.41 1-5
5. Stearns, L. Holden	1.55 2-5

FREE FOR ALL CLASS.

1. Stearns, F. B. Stearns	1.22 2-5
2. White, A. J. Scaife	1.22 2-5
3. White, W. C. White	1.39 2-5
4. Stoddard-Dayton, Frank Adams	1.42
5. Stearns, L. Holden	1.55 2-5

FAVORABLE STATISTICS FOR THE AUTO.

A Vermont statistician, writing under the nom de plume "Automobilist," contributes the following to a Barre, Vt., paper:

"During the year 1905 there were over 500 automobiles registered in Vermont, besides several hundred that came here from other states, yet how many deaths were caused by automobiles? None, unless you except the two occupants of an automobile that were killed in Bennington by being run into by a train at a railroad crossing. Here is an interesting table:

Killed by railroads	36
Killed by horse vehicles	15
Killed by falling down stairs	6
Killed by burns	12
Killed by machinery	12
Killed by firearms	14
Killed by lumbering	8
Killed by mistake in medicine	10
Killed by quarrying	8
Killed by bicycle	1
Killed by lightning	4
Killed by street cars	2
Killed by drowning	30
Killed by automobile	none

"Unless you reckon the two occupants of the automobile in the Bennington accident, these figures certainly show the safety of the automobile as compared with the horse vehicle, or anything, except the bicycle. Not a single death of a pedestrian was due to the automobile. The record outside of our state is equally favorable."



CLERK ASA GODDARD AND ASSISTANTS SACKETT AND BRANDT

LANCIA WINS ITALY'S TOURING EVENT

MILAN, May 25.—Italy's great touring contest for 1906, organized by the Automobile Club of Milan, with the Golden Cup as the trophy, brought together no fewer than 52 entries, representing 9 Italian makes, 6 French; 3 German and 2 English. Two thousand five hundred miles had to be covered by the cars at an average speed of 25 miles an hour for the first category and 22 miles for the second and third. Regularity of running was alone considered in awarding points, the car approaching nearest to the average fixed for the journey being the winner. A weak point in the regulations was that cars arriving before their regulation time were penalized double. This had, of course, been adopted to prevent racing, regularity alone being required. In practice the results were most unsatisfactory, cars which were before their time stopping by the roadside a few hundred yards from the control and crossing over as soon as the regulation time had expired.

The start was made from Milan in the early morning of May 14. The two thousand five hundred miles had to be covered in eleven daily stages right round Italy, passing through Bologna, Rome, Naples, Rome, Florence, Genoa, Turin, Milan, Udina, Brescia, and finishing at Milan on May 24, their arrival there being followed by the distribution of prizes and the inauguration of the International Automobile Congress. The total value of the chasis was officially quoted at \$152,000, and the prize list, partly in money and partly in trophies, including the

gold cup of the Automobile Club of Milan, amounted to \$50,000. Forty-one cars arrived at the end of the first stage, seven having dropped out en route. Macdonald was the first arrival on a San Giorgio. All but fourteen reaped penalty points.

Thirty cars arrived at Rome the end of the second day, and of these five were free from all penalty points, namely: Marsaglia (Diatto-Clément), Lancia (Fiat), Vercellone (Diatto-Clément), Grazziani (Itala) and Grigg (Daimler). Brilliancy was added to the arrival at Rome by the presence of the King and Queen in a Fiat, and by the later arrival of the Queen-Mother, also in a Fiat.

The arrival at Naples, the finishing point of the third stage, and a total of 704 miles, saw a total of 31 cars still on the road.

The fourth stage, Naples to Rome, reduced the total number to 28 cars, the three leaders being Lancia (Itala), Vercellone (Diatto-Clément) and Grazziani (Itala).

With the fifth stage, Rome to Florence, none but the high-power cars were able to finish the distance in regulation time. A total of 27 cars arrived, Macdonald on a San Giorgio being first, Lancia (Fiat) and Grazziani (Itala) now being the only drivers with clean sheets.

The most difficult stage in the run was undoubtedly the one from Florence to Genes, over 272 miles of steep, winding hills rendered worthy of the evil reputation of Italy by a drenching rain. Nevertheless, of the 23 starters 9 got through without penalization, Macdonald coming in first on his San Giorgio, followed by Cagno and Lancia, the Itala and Fiat champions.

From Genes to Turin, the seventh stage, 280 miles, had to be covered over rather better roads than those of the previous day. Fiat was still at the head for team position, with Lancia free from penalty, Isotta-Fraschini and Diatto-Clément coming respectively second and third for team performances.

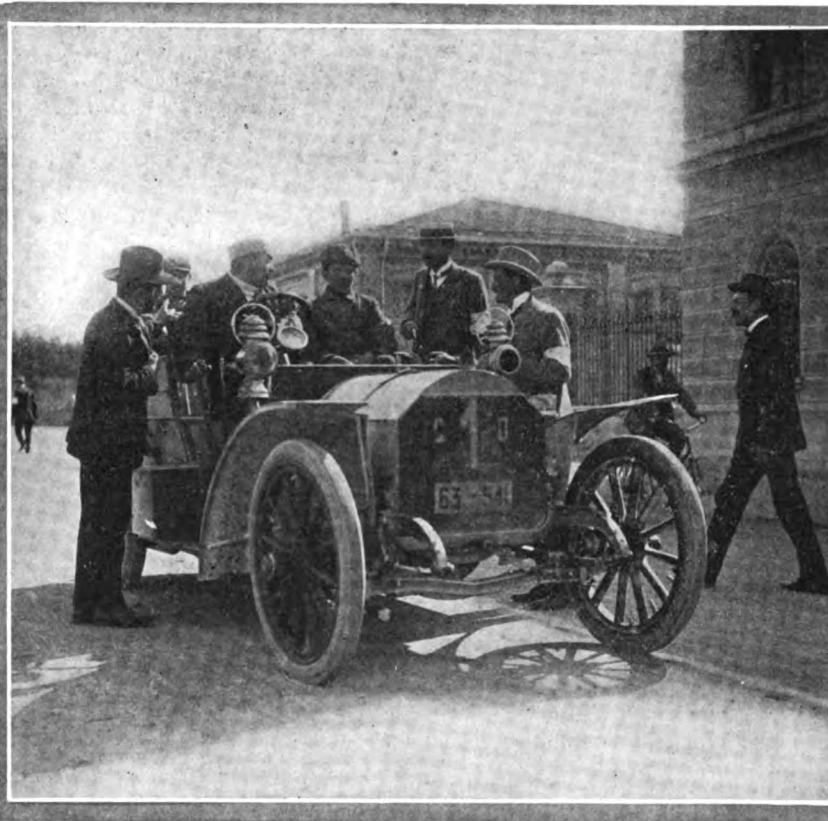
The eighth stage brought plenty of rain but no great changes in the relative positions of the competitors. Twelve of the eighteen starters from Turin reached Milan (141 miles) without penalization.

The ninth stage was a long run of 305 miles from Milan to Udina, and was covered by 14 cars without penalization.

The tenth and last stage but one failed to shake out any of the sixteen starters, and only one of them received a penalty point. This day's run brought the cars as far as Brescia after 253 miles.

A last stage of 99 miles from Brescia to Milan brought the long run of nearly 2,500 miles to a close. To the air of "God Save the King" Macdonald arrived first at the aeronautic grounds on his six-cylinder San Giorgio-Napier. The Italian national hymn greeted Cagno, Lancia and the rest of the Italians, and

NOW, LANCIA, THE LUCKY, IN HIS WINNING FIAT.



Nagliati and his De Dion were honored with the Marseillaise. The jury has yet to take into consideration many minor points and decide several protests before the official classification can be published. Of the first four or five places there can be no doubt, and the Golden Cup and \$5,000 will certainly be awarded to Lancia, who alone of the 16 competitors left out of the 48 starters covered the whole distance without penalization. This is the most complete success Lancia has yet attained.

The second prize of \$1,200 and the Cup of *The Automobile* of Milan will fall to Maggioni on a Züst car. The prize for the best team performance will go to Fiat also, Nazzaro and Boschis, Lancia's companions, finishing fourth and fifth. Summary:

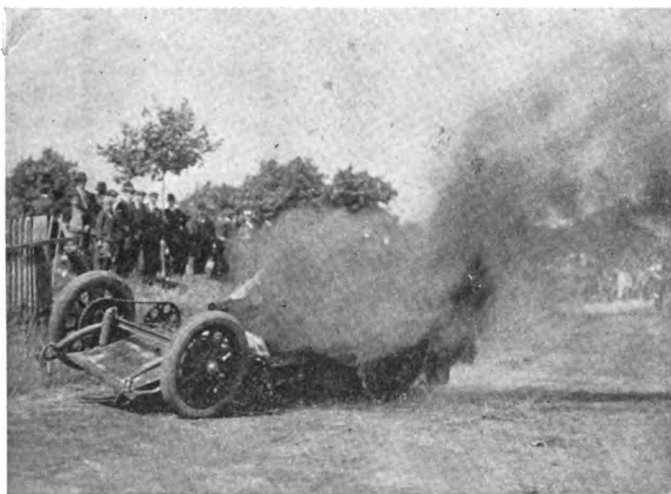
1. Lancia (Fiat); 2. Maggioni (Züst), 7 sec. lost on entire run; 3. Cagno (Itala), 10 sec.; 4. Nazzaro (Fiat), 35 sec.; 5. Boschis (Fiat), 1 min. 27 sec.; 6. Macdonald (San Giorgio-Napier), 2 min. 22 sec.; 7. Glentworth (San Giorgio-Napier), 6 min. 51 sec.; 8. Fraschini (Isotta-Fraschini), 1 min. 12 sec.; 9. Pfanz (Benz), 40 min. 51 sec.; 10. Vercellone (Diatto-Clément), 40 min. 51 sec.; 11. Vercellone (Diatto-Clément), 1 h. 35 min.; 12. Minoia (Isotta-Fraschini), 1 h. 43 min.

BASLE WAS READVILLE'S STAR.

BOSTON, June 4.—No better conditions could have been asked by the Bay State Automobile Association for its annual race meet at the Readville track than prevailed on Memorial Day. A light application of crude oil was all that was necessary to make the track absolutely dustless.

Just one untoward event marred the day's sport. This occurred soon after the racing begun. Two of the principal attractions on the card were match races in which Joe Downey, chauffeur for J. R. Harding, was scheduled to appear with the 80-horsepower Mercedes. He was to go against W. M. Hilliard in one race and against J. R. Harding in the other. On account of the rain Downey had not been able to tune up his machine since it came back from the Ormond races, so he took the first chance he had to escape from the paddock by the back gate, and to reach the track by a gate at the upper turn, which had been opened to permit some touring automobiles to reach the inner field. Without warning Downey sped by the grand-stand while the cars were coming out for the second race. The officials shouted to him with megaphones, but either he did not hear or did not want to; at any rate, he drove his high-powered racing car up the back-stretch at speed.

Meantime the upper gate was still open and touring machines were crossing the track. The three cars in the second race were



DOWNEY'S 90-HORSEPOWER MERCEDES BURNING.

also at the head of the stretch. Around the turn came Downey. When too late he saw the track blocked. Everything that he could do to stop his machine he did, and he steered the car by several of the smaller machines. He was almost clear when there was a crash, and a Mitchell car entered in the race was seen to go down before the big racer. Then Downey lost control, and the car made straight for the outer fence. Another crash, and twenty feet of fence was gone, the Mercedes was upset, and Downey was on the track in the dirt. The thousands of people had been on tiptoe with horror, and many had rushed on the track. They were relieved, however, when Downey picked himself up and was unhurt. The Mercedes quickly burst into flames and was damaged to the extent of several thousand dollars. The Mitchell car suffered little except a broken front wheel and steering knuckle. Altogether the outcome was very fortunate, but Downey's desire to practice at unauthorized times caused Referee Whipple to rule him for the track.

Luckily for the success of the meeting, Charles Basle, H. L. Bowden's expert chauffeur, was at hand, and with Mr. Bowden's consent was matched against Hilliard in the ten-mile match race. Hilliard drove the 80-horsepower Napier racer. Basle handled Bowden's 90-horsepower Flying Dutchman and won the race, defeating Hilliard by two-thirds of a mile. He drove the ten miles in 10:10 3-5, making the fastest circuit in 564.6 seconds. Basle was the star of the day, for after the match race he appeared in

the free-for-all, and, besides defeating Frank Durbin with the Stanley racer, made the ten miles in 9:27 1-5, which is a new record for the distance on the Readville track.

The steamers entered by Stanley, including the Vanderbilt Cup candidate, failed to come up to expectations. Fred H. Marriott was down on the programme to give a mile exhibition, and the time was 57 2-5 seconds. The Stanleys came out again in the free-for-all, but they did not make good.

The most popular event was that for gasoline cars listing between \$2,001 and \$3,000. The weeding-out process brought together in the final a Dolson, Jackson, Oldsmobile, Columbia, Rambler, and another Columbia. First honors went to the Rambler, which made the five miles in 6:32 4-5, the best time for gasoline cars in any of the five-mile events. Another interesting race in which the Rambler figured conspicuously was that for cars listing from \$3,001 to \$4,500. It was quickly apparent that the race was between the Stearns and the Rambler, and they made a good contest.

The final of the five-mile event for gasoline cars listing from \$1,000 to \$2,000 brought together a Grout driven by F. A. Grout, a Jackson driven by E. P. Blake, a Crawford driven by G. M. Wetherbee and a Mitchell with H. Foss at the wheel. It was the Grout's race all the way, that car winning in 7:00 3-5.

The race for gasoline stock cars listing at \$1,000 or less went to the Buick driven by Dr. J. F. Hovestadt. The ten-mile handicap event was won by H. P. Maxim with a 24-28 Columbia. Summary:

FIVE MILES, OPEN TO ALL STOCK STEAM CARS.

1. Stanley 20-h.p.; driver, Ernest Rogers, 5:33 2-5.

FIVE MILES, OPEN TO GASOLINE STOCK CARS COSTING \$1,000 OR LESS.

1. Buick 22-h.p.; driver, Dr. J. F. Hovestadt.
2. Maxwell 10-h.p.; driver, Ralph Coburn.

FIVE MILES, OPEN TO GASOLINE STOCK CARS COSTING BETWEEN \$1,000 AND \$2,000.

1. Grout 28-30-h.p.; driver, F. A. Grout, 7:00 3-5.
2. Crawford 24-h.p.; driver, G. M. Wetherbee.
3. Jackson 20-25-h.p.; driver, E. P. Blake.
4. Mitchell 24-h.p.; driver, H. Foss.

FIVE MILES, OPEN TO GASOLINE STOCK CARS COSTING \$2,001 TO \$3,000.

1. Rambler 35-h.p.; driver, H. E. Wilson, 6:32 4-5.
2. Dolson 45-50-h.p.; driver, H. A. Mathey.
3. Columbia 24-28-h.p.; driver, H. Woolaver.

FIVE MILES, OPEN TO GASOLINE CARS COSTING \$3,001 TO \$4,500.

1. Stearns 40-h.p.; driver, George G. Reed, 6:44 2-5.
2. Rambler 35-h.p.; driver, H. E. Wilson.

TEN MILES FREE-FOR-ALL.

- First Heat:
1. Mercedes 80-h.p.; driver, Charles Basle, 9:27 1-5.
 2. Stanley 30-h.p.; driver, Frank Durbin.
- Second Heat:
1. Stanley 30-h.p.; driver, F. H. Marriott, 10:44 3-5.
 2. Fiat 24-h.p.; driver, Emanuel Cedrino.
- Final heat won by Basle by default.

TEN MILES HANDICAP FOR GASOLINE STOCK CARS. OWNERS TO DRIVE.

1. Columbia 24-28-h.p.; driver, H. P. Maxim, 14:36 4-5.
2. Stearns 40-h.p.; driver, George G. Reed.
3. Rambler 35-h.p.; driver, H. E. Wilson.

SPECIAL MATCH RACE OF TEN MILES.

1. Mercedes 80-h.p.; driver, Charles Basle, 10:10 3-5.
2. Napier 80-h.p.; driver, W. M. Hilliard.

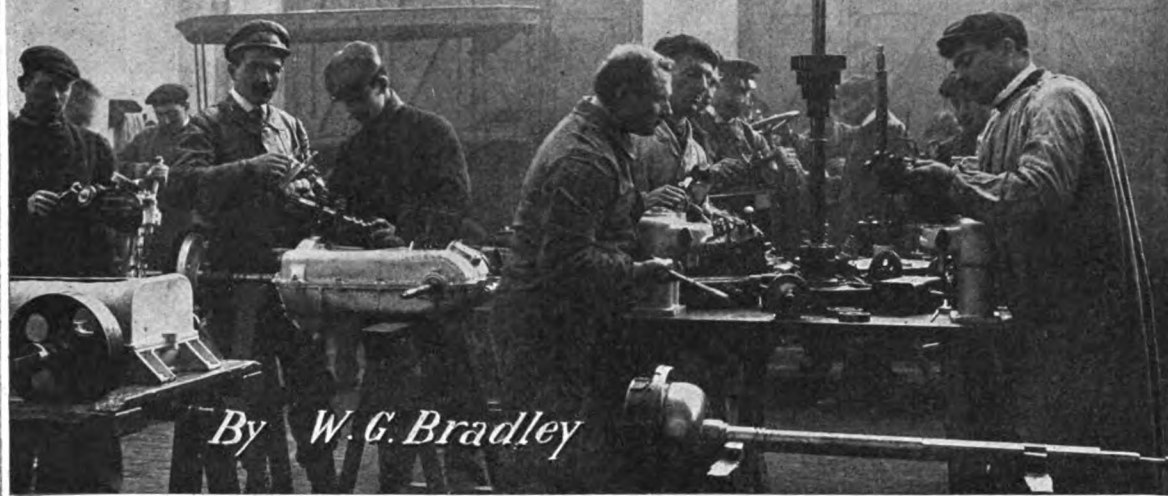
EXHIBITIONS.

- Five-mile exhibition by Premier 100-h.p.; driver, J. W. Moore, 5:23 3-5.
- Five-mile exhibition by Fiat Jr. 24-h.p.; driver, Emanuel Cedrino, 5:04 3-5.
- One-mile trial by Stanley racer; driver, F. H. Marriott, 57 4-5.
- One-mile exhibition by Columbia 24-h.p.; driver, H. Woolaver, 1:12 3-5.

MARYLAND HAS NEW TRACK RECORDS.

BALTIMORE, June 2.—Arthur Stanley Zell, driving a stripped 50-horsepower Thomas in the speed trials at Electric Park this afternoon broke all state records from one mile up to five miles inclusive. His best mile was 1:23 2-5 as against the former mark of 1:25. The total time for the five miles was 6:59 3-5 against the former record of 7:05 1-5. The previous records were held by Edmund Buchanan, who made them in a 24-30 Pope-Toledo last season.

AUTOMOBILE EDUCATION IN FRANCE



By W. G. Bradley

ASSEMBLING ROOM OF THE PANHARD & LEVASSOR AUTOMOBILE FACTORY

LONG after the automobile had conquered a supreme position in the elegant and aristocratic portion of the city of Paris known as the Etoile, a fierce struggle was carried on in the crowded and unpicturesque background which forms the inevitable accompaniment of every wealthy district. Driven out of the main avenues by the invincible automobile, the job master and riding school proprietor has had to take refuge in the back streets; but even here his position is far from secure, for the garage proprietor and automobile repair man, an enemy only second in importance to the big selling agent, still wages war. The horsey man who earned his living at the riding school is probably the greatest sufferer from the invasion.

Inefficiency of the Average Automobile School.

With one or two rare exceptions, the "plant" of a Paris automobile school consists of four or five single-cylinder cars of an antiquated model, so many parts of which have been replaced at different times that it would be difficult to discover the original car. On the subject of the age of his motors the proprietor observes an artful discretion that would do credit to any maiden lady. If asked by some novice in motoring if his machines are of the latest model, the proprietor will blandly reply, "They are 1904 cars; I could not get new machines every year, for some of the pupils use them so roughly." It is a marvelous testimony to the value of the cars that after eight or nine years' service—and service of the roughest kind—they are still capable of doing useful work.

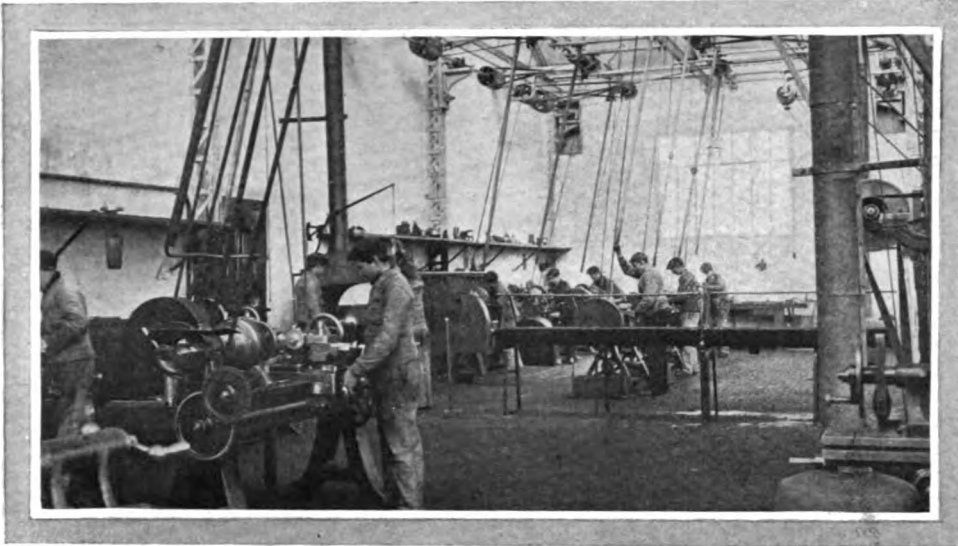
Many a pupil turned out from these schools has never touched the spark or throttle control or run on any other than first and second forward speeds from the time he entered the school to the moment he left it with his chauffeur's certificate in his pocket. After a fortnight of alleged lessons, during which time the pupil has had a quarter of an hour's actual driving per day, has idled about the garage, given a helping hand to the repair man, washed a car, cleaned a dismantled gear-box and cranked a four-cylinder Panhard for some encouraging professional, made the acquaintance of every chauffeur frequenting the garage and listened to a theoretical lecture when the proprietor had time to give it, he is sent up to the inspector of the Service des Mines for examination, his photograph, his military papers and his birth

certificate having previously been forwarded, according to law, to the prefect of police.

The Government Examination of Chauffeurs.

Notwithstanding all that has been written about the intention of the authorities to make the examination for driving certificates more stringent, nothing has yet been done, the regulation in existence for the last three years still being in force. In some parts of France the inspector, having little work on hand, will take the candidate for a twenty mile run, testing his ability to handle the machine on all grades, in traffic and on various curves. In Paris the matter is much more simple. The inspector's office is at the corner of a big block of buildings in a crowded portion of the city near the Place de La République.

On arriving at the office, the car having been driven through the city by the instructor, the candidate reports himself and awaits his turn amongst a group of would-be Thérys gathered round the most miscellaneous collection of cars it is possible to imagine. "Crank your motor," says the inspector, and if this operation is successfully performed he mounts by your side and orders you to drive round the block of buildings and come back to the same point. At the same time a fussy little single cylinder, also driven by a novice, will be told to run round side by side with you, and a third car is driven by a candidate either ahead or in the rear. In three minutes the cars are back again to the starting point, and if no motor has been stalled and no vehicle run into during the trip three certificates are at once made out testifying that the holders are capable of driving a gasoline car of a certain horsepower. From beginning to end, three candidates are passed in from seven to ten minutes, thus maintaining the reputation of the automobile for speed. Armed with his government certificate, the newly-fledged chauffeur searches for a situation, and, despite his meager knowledge, usually finds one in a short time. Many men enter the big garages as washers and there pick up a more extensive knowledge of automobiles, finally becoming engaged by some owner as professional chauffeur. Over and over again the unsatisfactory nature of the automobile instruction given in Paris has been commented on by the various representative bodies and authorities. Not only are the schools



WORKROOM OF APPRENTICES AT THE PANHARD & LEVASSOR FACTORY.

bad, but the inspectors themselves are accused of knowing very little about the new means of locomotion. The authorities admit that the accusation is just, and have quite recently arranged for a series of lectures to be given to the inspectors by M. Emile Cahen, of the Mors factory.

A Practical Reform to Be Inaugurated.

The Association Générale Automobile, a body working under the patronage of the Automobile Club of France and occupying itself with such practical matters as the supplying of chauffeurs, touring information, legal advice and protection, sign posts and road conditions, a discount on accessories bought by its members, and similar matters, has taken the matter up and endeavored to remedy the evil. Two chauffeur's examinations have been arranged, one being merely a driving examination intended to replace the present examination before the government inspector, the other being for the chauffeur-mechanic diploma. For the former examination the candidate must furnish all the papers required in the ordinary way by the prefect of police and present himself at the association offices with a car when called upon. Starting the motor, running forward on various gears, running backwards, climbing and descending hills, sharp turns and stops are all points on which the candidate is tested. In addition, he is interrogated on the principles of the motor.

rules of the road and signals, and his eyesight and hearing are tested. The inspector's notes are sent to the prefect of police, who grants a driving certificate if he considers them favorable. As it is well known that the association examinations are thoroughly searching, these certificates are much more valued than those granted on an examination passed before the government inspector. The chauffeur-mechanic examination includes all that is in the former test with, in addition, an examination on the candidate's mechanical ability and close inquiry into his moral character. The diploma must be renewed every year, and each time the holder changes employment he must advise the association of his move. Americans

engaging a chauffeur in France would be well advised to take only a man holding the association diploma, as in view of the great demand in Paris for chauffeurs speaking English, numbers of individuals with a dangerous smattering of motoring and a little linguistic ability obtain a driving certificate and endeavor to secure wider knowledge at the expense of some citizen of the United States.

Up to the present the Association Générale Automobile has not been able, owing to the lack of funds, to undertake automobile instruction itself. At the last Paris Salon, however, it was decided that, in view of the urgent necessity of better instruction in motor matters the association should establish a school. Arrangements are at present being made for the purchase of a plot of land in Paris or the immediate neighborhood for the erection of a first-class automobile school. There is no possibility of the school being opened this year, but when completed the building will be the most complete and the instruction the most thorough of any similar institution in the world.

Instruction as Given by the Factories.

Except when requested to do so by their customers, the big automobile firms do not give instruction in motor driving. There are two exceptions, however, the De Dion Bouton Co. and Panhard & Levassor. At the former factory is a course for volunteers in connection with the repair department. Not more than twenty men are received at once, and their average length of time in the class is three weeks, during which period they are given instruction in the principles of the motor, and taught to drive and attend to such minor repairs and regulations as are likely to be needed on the road. A fee of \$10 is paid by each pupil, and he is presented for the chauffeur's examination at the end of the period of instruction.

The Panhard & Levassor Factory School.

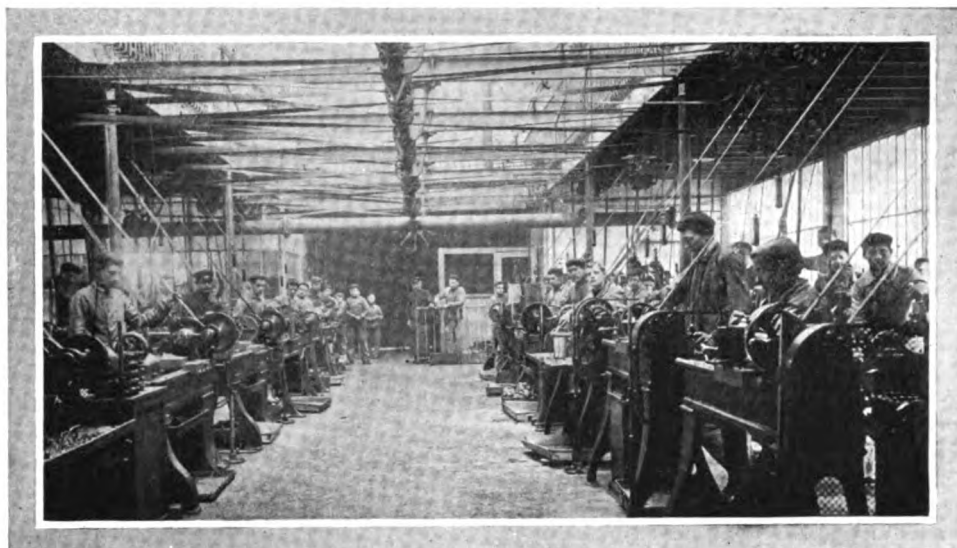
The best equipped motor school in Paris is undoubtedly that at the Panhard & Levassor



ANOTHER VIEW OF APPRENTICE DEPARTMENT AT THE PANHARD WORKS.

factory. Officially the Panhard people have no school, have never claimed to turn out experienced chauffeurs, and have never presented a candidate for examination. About seven years ago a semi-private class was opened for owners of Panhard machines anxious to obtain some insight into the mysteries of automobiles. From the onset the class was a success, and, though never advertised, demands for admission came in with a rush, a far wider range than Panhard owners asking to be allowed to participate. It was beyond the scope of the firm to establish a complete automobile school, notwithstanding the great demand for such an institution, and the period of instruction had to be limited to six days, four of which

are spent in class and two on the road. The period is brief, but the instruction is complete; from 8 o'clock on Monday morning at 6 o'clock on Thursday evening the pupils are drilled in everything concerning a motor. An early model, much enlarged, of an internal combustion motor is first examined and the principles made clear. A large selection of explanatory charts and models are employed to help the students, and among them is a very useful model to illustrate the four cycles of an engine. It consists of a large cylinder in section on a painted board, fitted with an ordinary sparking plug, inlet and exhaust valves and the background of the cylinder made of ground glass. There is a wooden piston which, by means of a crank, is made to ascend and descend, and on the commencement of the third stroke a spark appears and at the same instant the interior of the combustion chamber is illuminated to indicate the firing of the charge. He would, indeed, be a hopeless individual who, after a few minutes' explanation before this working model, did not understand the four-cycle operations. As far as possible the actual parts of an automobile are examined in detail; thus a complete cylinder with its valves and sparking appliance is examined, dissected and put together again; the same is done with the carbureter, the pumps, accumulators and magnetos, clutch, change speed gear and differential. The pupils take off wheels, regulate brakes and side chains fitted on false frames for demonstration purposes. On Friday morning the entire class is divided into groups of four each, placed on board a car in charge of a skilled mechanic and sent out for two days. The mechanic discovers a number of minor regulations to be attended to on the road, and when Saturday night arrives, though each one may not be an expert chauffeur, there has been formed a group of young men well drilled in the principles of motoring. A small number of the pupils are, on special request, drafted into the finishing and testing shops, where they spend a week under the direction of an experienced workman. Once a fortnight owners only are received at the school



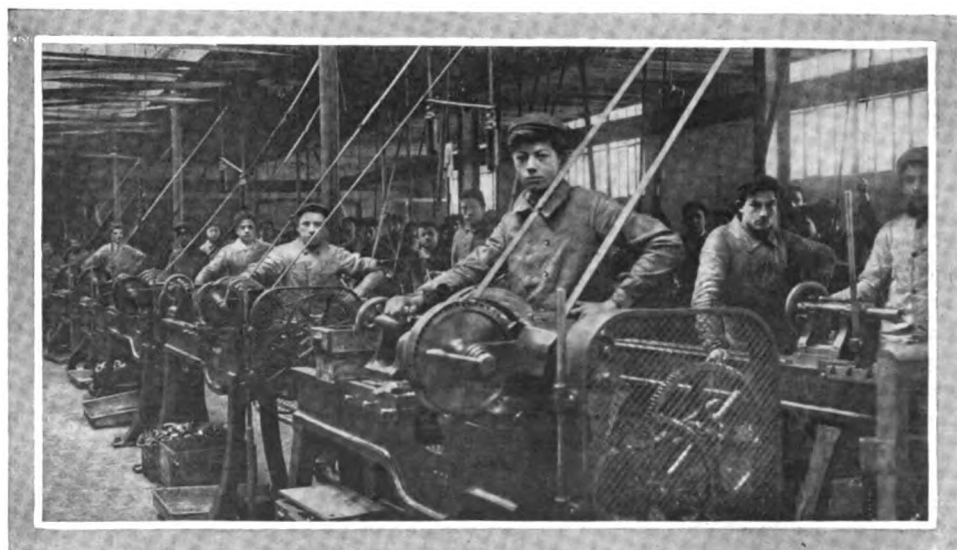
APPRENTICE SCHOOL OF THE DARRACQ FACTORY, SIXTY-FIVE AT WORK.

and are given the same training as that just described. In no case, however, are complete chauffeurs, in the legal sense of the term, turned out, the firm refusing to present candidates for the government examination for a driving certificate.

The Panhard Workshop for Apprentices.

Ignoring the state and municipal technical schools, such as the *École des Arts et Métiers*, where complete theoretical instruction is given in engineering, and where of recent years some attention has been paid to automobiles, the most valuable recruiting ground for future automobile experts is to be found in the factories of the big manufacturers. The French factory law forbids overtime or night work in establishments where women and youths under eighteen are employed, and as overtime is more the rule than the exception, automobile manufacturers have been obliged to banish all young people from their shops. Rigorously carried out, such a law would cripple the industry by reason of the dearth of skilled workers which would result in a few years' time, and to obviate this a special workshop, having no connection whatever with the main factory, is conducted by many of the more important firms.

At the Panhard & Levassor factory is such a work-



ANOTHER VIEW OF THE DARRACQ APPRENTICE WORKROOM.

shop, where youths, mostly the sons or near relatives of workmen employed by the firm, are received at fourteen years of age and drilled until they are eighteen, at which age they pass into the factory as artisans. The Panhard apprentice school is a separate shop, at one corner of the self-contained township in which the world-famed cars are produced, with accommodation for sixty, but usually containing not more than thirty pupils. On entering, the youths are paid one cent an hour and are accorded an increase of two or three centimes every six months, the last six months of their apprenticeship being paid four cents an hour. Though equipped with a forge, drills, lathes and various machine tools, and working under the direction of two instructors, no apprentice work is allowed to go into the factory. All tools required by the apprentices are made in the school and prizes are given annually for good workmanship. Being entirely unproductive, the school is a direct charge on the factory. Furthermore, soon after the completion of their apprenticeship most of the youths leave the firm, enticed away by the offer of higher wages in the smaller factories. No attempt is made to retain them, for the managers know that, like the prodigal son, they will come back again, bringing with them a ripened experience and minus that superior knowledge so common to newly-formed graduates. Out of 1,800 workpeople there are at the present time 100 who received their training in the firm's school.

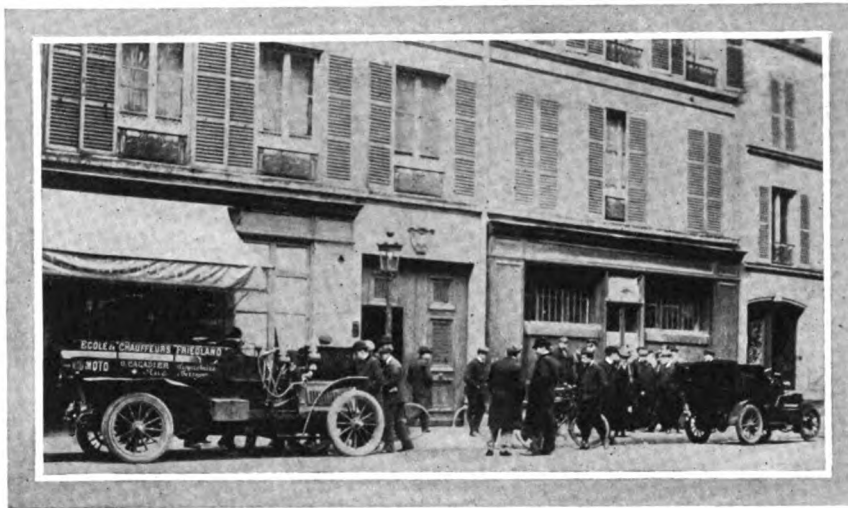
Darracq Apprentice School the Largest.

Darracq et Cie. have, in their huge works at Suresnes, the largest school for apprentices. At one end of the main hall is a glass and iron partition pointed out to visitors as "our apprentice school." No other information is vouchsafed and a desire to enter is met with a polite but firm refusal. A specially signed order must be obtained, armed with which the visitor presents himself at a small sliding window in the glass front and timidly knocks. A chubby face peers through the opening, a greasy hand takes your passport, the window is closed and bolted, and you are left standing amid the roar of the machinery. A few minutes later a glass door slides back, apparently the same greasy hand beckons you in, locks the door behind you, and hurries away to lay the keys on instructor's private desk. These precautions are necessary to keep the school separate from the factory, no workmen ever being allowed to enter the pupils' quarters, and the only knowledge the boys have of the main works is by a hasty glance on the entrance of an occasional visitor. The main entrance is by a separate door leading directly into the street. There are sixty-five pupils between 13 and 14 years of age, and in the foreman's office is a long list of names of youths waiting for admission, amongst them being letters from parents in towns as far distant as Monte Carlo. The first year the boys earn one cent an hour, the second year two cents, the third year four cents, and during the fourth year are put on piece work. If he is sufficiently skilled, and his work will allow of it, a youth will be given piece work before his last year's apprenticeship in order to encourage him. A youth of 17 was noticed

turning out small bevel gears for differentials, at which task he was earning \$1.00 a day—a high wage in a country in which skilled artisans do not average more than \$1.40 a day. In summer the school is open ten hours a day, and in winter the hours are reduced to nine in order that boys may be encouraged to attend educational evening classes. The very strictest discipline is maintained. The factory is complete and self-contained, power being supplied by a separate dynamo, and the plant, consisting of a forge, thirty-eight lathes, six drilling machines, three cutting machines, two shaping machines, one mortising machine, five screw-making lathes and thirty-five vises. Among them are several American machines supplied by the American Tool Works Co., of Cincinnati, J. Stephtoe & Co., of Cincinnati, and Hill, Clark & Co., of Chicago.

Three permanent instructors look after the training of the boys, who are employed exclusively at their trade, no time being lost doing menial labor, running errands, or the thousand and one outside jobs usually allotted to an apprentice. As soon as they are sufficiently skilled the pupils are allowed to work for the factory, a high standard of excellence being insisted upon, and every finished article being carefully examined by the instructor before passing into the store. All tools and repairs required in the school have to be executed

on the premises. Generally each boy repairs his own breakages, and is then taught to handle his machine with care, for if he causes an accident while on piece work the repair has to be done at time rates, entailing a serious diminution in the week's earnings. A small number of women are employed in the apprentice school—the law not allowing them to enter the main factory—where they earn 10 to 11 cents an hour



EXAMINATION OF CHAUFFEURS IN PARIS BY THE FRENCH GOVERNMENT INSPECTOR.

drilling holes. Their more delicate touch enables them to obtain a greater output with less breakage than is the case with men.

During the first year the boys are taught adjusting; the second year they work at the drilling machine, the shaping machine and the mortising machine, and the last twelve months are spent at the lathe. On reaching the age of eighteen the majority of the pupils pass into the main works, the greater number to work at the machine tools, a smaller number as fitters. Most of the apprentices remain permanently with the firm, there being no tendency on the part of the Darracq fledgling to seek adventures abroad.

The enormous importance of the automobile industry to France will doubtless have its effect in the training of chauffeurs and mechanics in the not far distant future, for the existence of a positive demand must invariably bring forth a supply. There is certainly a demand for competent chauffeurs and skilled mechanics, and this is proved by the ease with which positions as chauffeurs are obtained by men whose qualifications for the work are of the slenderest and who rely upon the experience gained at the expense of their employers to hold their places. No such deception is possible in the automobile factory, of course, but the supply of skilled men outside the great works is limited, and there is plenty of room for them, if not in France, in other parts of the world.

PLAIN BEARINGS AS USED IN AUTOMOBILES

THOUGH ball and roller bearings have been brought to such a state of excellence that they can be used in practically every bearing of the automobile, plain bearings are still used to a very large, though decreasing, extent. Road wheels, live rear axles, propeller shafts and countershafts are now always fitted with ball or roller bearings; the transmission shafts are very commonly fitted with anti-friction bearings; but in the engine the plain bearing is still in the lead, only a very few makers using anything else for crankshafts.

Plain bearings are as old as machinery—and older, for the first cart had to have a primitive bearing of some kind for its axles to turn in or its wheels to run on, and it is pretty certain that neither ball nor roller bearings were then in vogue.

Naturally every seemingly suitable substance has been tried by engineers for bearings, with all kinds of results, and the various individual properties of different metals have been turned to account. For instance, the fact that cast iron, under the influence of friction, will become almost glass-hard on the rubbing surface has been found of value in bearings. Steel bearings, made hard to resist wear, have been tried. But until recently nothing seemed to be so suitable for resisting wear and decreasing friction as brass, and so commonly has this class of alloys been used for bearings that the term "brasses" has come to be synonymous with bearings. When a mechanic speaks of brasses he usually means the two halves of a split bearing, the commonest form in ordinary machinery.

The Distinction Between Journal and Bearing.

Just here it may be well to insert a word of explanation. The terms "journal" and "bearing" are often used interchangeably for the part of the shaft that turns in the brasses, or for the brasses themselves. Properly speaking, the journals are those parts of the shaft which run in the bearings, and the bearings are, of course, the brasses or their equivalent.

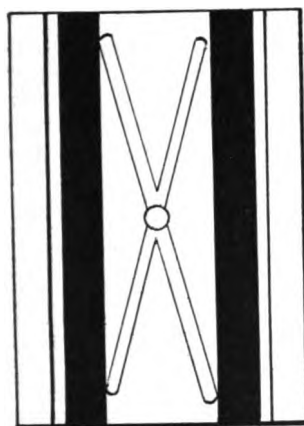
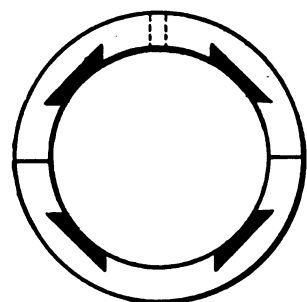
One of the requisites of a bearing metal used in the ordinary way is that it shall be softer than the journals. If this were not the case the journals would be ruined in case of the stoppage of the supply of lubricant. The bearing being comparatively soft, any cutting or abrading action affects it and not the shaft, so that the least expensive part is renewed or resurfaced, and not the shaft, which is a costly affair. Moreover, the refinishing of the shaft would necessitate more or less reduction of its diameter and a consequent weakening. In view of these facts, hardened steel is practically out of the list, and cast iron, notwithstanding its fine bearing qualities in other respects, is also ineligible, though instances can be found of the use of both of these metals for automobile bearings.

Alloys Suitable for Bearings.

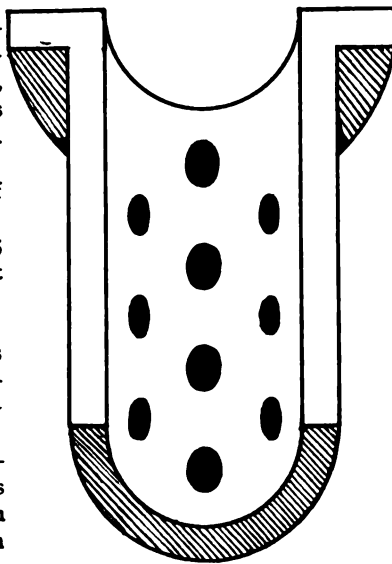
The metals in practically universal use for bearings may be divided into three classes: (1) Brass or bronze. This may

be anything from the softest yellow brass up to a bronze of such hardness as to be unsuitable for bearings. (2) Babbitt. A soft bearing metal that is made and sold under a variety of fancy names and may consist of all kinds of mixtures of tin, copper, antimony, lead or zinc. The cheapest babbitts are practically pure lead, or lead and zinc with a little antimony and possibly a little tin added, while the best babbitts contain little or no lead. A first-class babbitt metal may consist of about 85 parts tin, 10 parts antimony and 5 parts copper, the exact proportions varying somewhat in various brands. (3) White brass or white bronze, a bearing metal containing aluminum, tin and zinc, the aluminum predominating. This metal has proved its excellence in very severe service, such as large marine work.

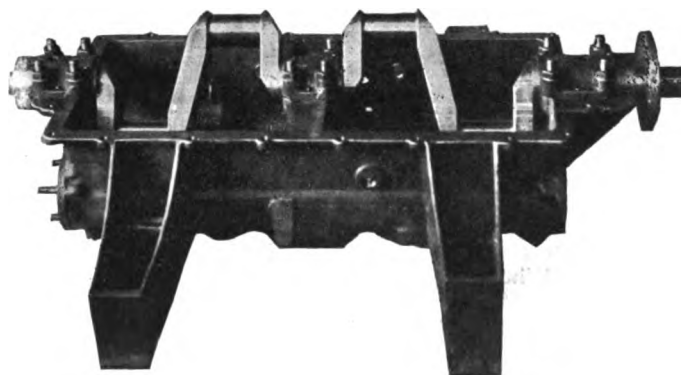
While bearings are frequently made of solid bronze and occasionally of solid babbitt, it is common to find the two combined. Babbitt is soft and plastic and will melt at a comparatively low pressure. Brass, on the other hand, is comparatively hard, and in the absence of lubrication it is apt to abrade the journal somewhat. But if the bearing has inserts of babbitt, so that part of the bearing area is of bronze and part of babbitt, the best qualities of the two metals are brought forward. Suppose the journal to be running in its bearing under normal conditions with plenty of oil and no overheating. The surface of the bearing will be unbroken, the brass and babbitt sharing the burden. If, however, the oil supply is cut off, the bearing gradually becomes dry, and friction results in an increased temperature. Now the coefficient of expansion is greater in babbitt than in



DOVETAILED BABBITT STRIPS.



SPOTTED SPLIT BEARING.

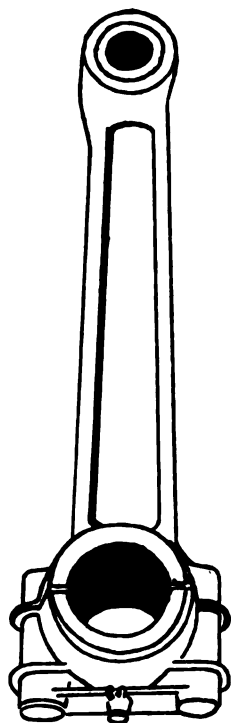


BEARINGS BOLTED TO UPPER HALF OF CRANKCASE.

bronze, and consequently the babbitt will expand and carry the journal clear of the brass until the oil supply is resumed and the bearing cools and permits the existence of normal conditions. This is the theory, and while in practice it may not always work out exactly as it should, still the results obtained from the use of combined bronze and babbitt bearings are quite good enough to justify their wide use. Owing to

its softness, babbitt is, of course, incapable of damaging the journal in the least.

Solid babbitt bearings have their advantages, though in order to carry heavy loads without distortion the metal must be so compounded and treated as to be harder than ordinary babbitt. Babbitt will carry its load in the absence of lubrication better than most bronzes, and under normal conditions the bearing surface quickly acquires a glaze that greatly reduces friction. The glaze on babbitt may be imitated by taking a piece of ordinary putty and rubbing it gently with a smooth pencil or other object, when a polished surface will be formed that reminds one strongly of the glaze on a babbitt bearing.



MODIFIED MARINE TYPE.

When babbitt is used with bronze it is usually put into cavities formed for the purpose in the inner surface of the brasses. Sometimes the babbitt is placed in circular depressions in "spots" and sometimes it is dovetailed into the brass in longitudinal strips. Another way is to give the entire bearing a thin coating of babbitt which can be renewed when worn out. Babbitt inserts are often compressed into their cavities by a rolling process which not only causes the soft metal to expand and lock itself in, but also makes it closer in texture and considerably better able to resist wear, according to manufacturers who use it.

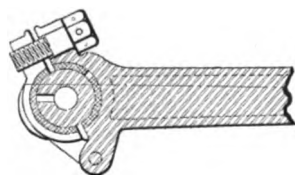
The Value of Perfect Lubrication.

In order to distribute the lubricating oil over the whole bearing, grooves are cut, extending from the oil hole, which is usually at the middle of the bearing at the top, almost to the ends. Sometimes a single groove is cut, and sometimes there are two or more. Similar grooves are frequently cut in the bottom of the bearing to collect superfluous oil and carry it into the crankcase.

Solid bronze bearings are hard enough, of course, to resist distorting tendencies, and in the modern alloys show remarkable anti-friction and anti-heating qualities. The simplicity of the all-bronze bearing is greatly in its favor, and it is very widely used for engine bearings.

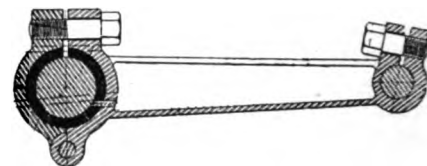
Adjustable and Nonadjustable Bearings.

The forms of bearings are various. The simplest, of course, is the plain cylindrical bushing, and this form is very often used, even for the main crankshaft bearings. A plain bushing of suitable bronze, with ample area, will give excellent results. When worn, a new bushing can be inserted, and thus the necessity for providing means of adjustment is avoided. With a bearing of this type the shaft must be so hard as to show practically no wear; otherwise the new bushing will be too large. High-class crankshafts are usually of rather hard steel, and in some cases the journals are casehardened. A simple means of adjustment is provided by splitting the bearing lengthwise, the two halves being held together by the two halves of the crankcase between which the bearing is held or else bolted to one-half of the crankcase. When the bearing is worn, it is taken out and the abutting edges filed down so that when the



HINGED BIG END.

two halves are put together again they will fit the journal closely. If a bearing is badly worn it may be necessary to put it in the lathe and take a light cut through it, as it may be worn oval. The filing must be very carefully done in order to reduce the bearing equally all along. When "shims" are used, however, the reducing is done without filing. Shims are thin strips of brass or copper inserted between the edges of the brasses. The bearing is fitted with the shims in position; when wear occurs, a shim is taken out from each side—or as many shims as may be necessary to bring about the desired reduction—and the bearing again tightened down. Thus the reduction cannot be unequal, and by using shims of different thicknesses any desired reduction may be obtained.



ADJUSTABLE AT BOTH ENDS.

Connecting Rod Bearings in Various Forms.

In the case of the connecting rod "big end" the bearing must, of course, be split to get it on the crankpin. In single-cylinder cars a very general practice is to hinge the cap that forms the end of the rod and put a bolt through lugs on the side opposite the hinge. This forms a convenient arrangement, and one that is very satisfactory when properly made, with a substantial hinge and a heavy bolt. The majority of big ends, however, are of the marine type, with the cap secured by bolts on both sides; occasionally the well-known gib and cotter arrangement, which is used in steam engines and can be seen on any locomotive, is modified and adapted to gasoline engine work; but this is rare. The fact that the big end is inside the crankcase, and that if anything goes adrift a smash is sure to result, makes the simplest possible arrangement the most desirable, as long as it will do the work properly.

The wrist-pin or piston pin bearing is in most cases a plain bronze bushing forced into the bore in the "little end" of the rod. Occasionally a split bearing is used with a pinching-screw at one side to take up wear. The piston pin is usually of case-hardened steel. An interesting variation consists in clamping the piston pin rigidly into the end of the connecting rod and making it work in two bronze bushings in the piston bosses. In this way a large bearing area is secured and the danger of the piston pin coming loose and scoring the cylinder is obviated.

Old though the plain bearing is, it is still being improved, and will doubtless continue to be improved until it is supplanted by some form of bearing that will do the work better. It is certain, however, that the plain bearing will be with us for a long time yet, though it is no longer the only practical bearing for heavy work.

The Rev. F. B. Meyer, England's prominent Baptist minister, who is almost as well known in the United States as in Europe, intends undertaking a village motor tour throughout the United Kingdom. At the recent Baptist conference in London a strong stand was made against Sunday motoring, and the King of Spain, who undertook a tour in the Isle of Wight on the Sabbath, was severely handled.

Extensive motor-bus services are being put through in Vienna and the new mode of locomotion means a saving of just an hour and a quarter as compared with the horse-buses on the same route of ten kilometers.

San Francisco's great fire burned a 26-mile circle, according to the measurements made by an automobilist who skirted the burned district in his car.

AUTOMOBILES FOR EVERYBODY IN NEW YORK

By HARRY W. PERRY.

IN no other city of the world is such public use made of the automobile as in New York—not even in Paris, the center of all things ultra in automobiling. For, little as it has been exploited, the public automobile livery service in New York is the most extensive in the world, and the New York Transportation Company that operates it is the largest single owner and user of automobiles in the United States.

The old resident of the city has become accustomed so gradually to the presence of the electric hansom and electric brougham on the streets of the metropolis that he gives no more thought to them than to the horse-drawn cabs and hacks, and the visitor accepts them as one of the many features of life in Manhattan that make it different from existence in his home city, and, while he finds it convenient and expeditious to order an electric carriage by telephone and be whisked rapidly from his hotel down to Wall street or to the railroad station or steamship pier, he has no idea of the extent of the service and the magnitude of the plants required for its conduct.

Nearly 650 employees are now carried regularly on the books of the company. At the present time there are 344 drivers, 59 battery men, 62 mechanics, 26 electrical workers, 17 carpenters, 14 painters and 122 shifters and general garage helpers.

It should be of widespread interest to be told something of a business that plays so important a part in the activities of our foremost city and is of such an up-to-date nature. No less than 616 self-propelled vehicles are owned and operated by the company, which maintains three stations on Manhattan Island for their storage and care. All but eighteen of the vehicles are electrics, most of them being Columbia

hansoms and broughams. To be more specific, the different types of cars and the number of each are as follows:

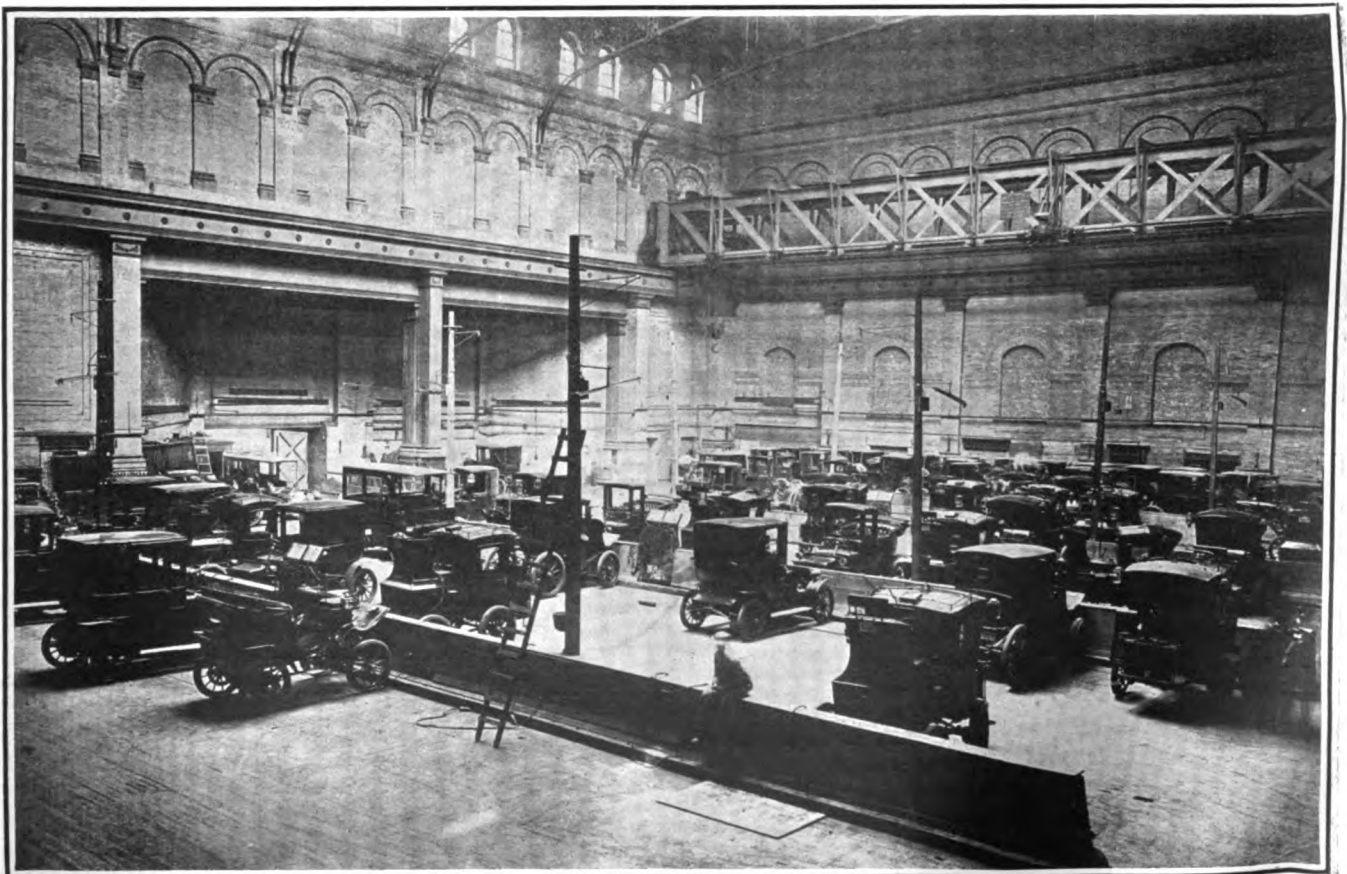
Type	Number
Hansom cabs	202
Broughams, end loading	159
Broughams, underslung batteries	90
Victorias	40
Convertible brougham-victorias	26
Landaulets	25
Two-seated surreys	23
Opera 'buses	11
Three and four-seated surreys	10
Delivery wagons and trucks	7
Emergency repair wagons	3

GASOLINE

Touring cars	18
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The great majority of the foregoing vehicles are maintained at the main station, which occupies about half of the big street car barn of the Metropolitan Street Railway Company, occupying the block on Eighth avenue between West Forty-ninth street and West Fiftieth street. Here there is every facility for the storage, care and repair of vehicles, and the recharging and renovating of batteries and loading them into the vehicles. A systematic method of despatching vehicles upon receipt of order by post or telephone is followed, and there is a complete record system by which the work of machine and driver is recorded daily and preserved in the files.

From 350 to 400 or more drivers are employed regularly during the year, and are paid according to the time actually spent in driving service, just as street car motormen are paid by the number of trips made daily. When the men report in the morning they are assigned to certain cars for the day and remain ready to take them out when directed by the floor



"BOARDERS' STATION AT THIRD AVENUE AND SIXTY-SIXTH STREET, SHOWING CHARGING ARRANGEMENT.

foreman, who, as a rule, sends the men out in rotation in the order in which they report for duty. As a car emerges from the exit the doorman inspects the interior to see that it is clean and in good repair and an oiler gives the motors a thorough final oiling. The time is rung up on a recording clock at the door with a key numbered to correspond with the driver's operating license, which has to be obtained from the Secretary of State. Upon returning to the station the driver enters at a side door, where his time is stamped on the daily report card which he carries with him and which is turned in to the auditing department at night. This report card includes, in addition to the times of departure and return, the mileage for each trip, condition of the battery, cash fare received or amount to be charged, and other desirable information for keeping complete account of the work of the vehicle and its operator.

A very important feature of the main station of the company is the battery room, where 500 batteries can be charged simultaneously and which has two huge electric traveling cranes each capable of lifting ten of the 1,600-pound batteries and depositing them on a train of iron trucks that run on one of several tracks passing through the battery room from one side to the other. On one side these trains run under hydraulic rams that raise the batteries separately and load them into the waiting vehicles. On the other side they run into a large battery renovating department where they can be cleaned and entirely rebuilt when necessary. By means of this system and with expert handling the batteries are loaded into the bodies at the rate of more than one in two minutes.

Besides this main station, there is a branch station in the huge powerhouse formerly occupied by the Metropolitan Street Railway Company, at Third avenue and East Sixty-sixth street, where there is storage space for more than 150 vehicles and charging plugs for sixty-eight cars at a time. Here are kept electric broughams, victorias and landaulets, which are rented by the week or month, and also the eighteen gasoline touring cars that were added to the equipment last year and which are rented for any period desired, from an hour to a year, or for special trips to definite places. At this station the batteries are never removed from the electric vehicles.

A smaller station is maintained on Vesey street, near the financial district, for the accommodation during the day of vehicles which are used by customers in going to and returning from business on the Stock Exchange or in their offices.

In addition to its livery service and the renting of vehicles by the month, including seven delivery wagons and trucks, the company takes "boarders," that is, stores and cares for vehicles owned privately. These are handled both at the main station (in a special department where half a hundred can be stored with comfort and two dozen can be charged at the same time direct from the Edison system) and at the Sixty-sixth street station.

A vehicle is never hired without the services of a driver, whether for merely a fifteen-minute ride to the depot or for a month. Thus the company assumes the responsibility for accidents and holds the driver accountable for damages. When a vehicle is rented by the month, the driver is not changed and is paid monthly wages, regardless of time spent in driving. The rates for monthly service range from \$275 for a hansom to \$350 a month for a four-passenger landaulet, provided the maximum mileage for the month does not exceed 650 miles; and for weekly service from \$80 to \$125 if the mileage is limited to 150 miles. For use in excess of these figures a charge of thirty cents a mile is made.

There is a regular printed tariff of rates for livery service based on the general service rates of fifty cents a mile or fraction thereof for hansom or two-passenger brougham and seventy-five cents a mile or fraction thereof for victoria or four-passenger extension brougham, surrey or landau, and

seventy-five cents a half hour or fraction for waiting with any of these types of vehicle. For shopping and calling there is a special rate of \$1.50 an hour or fraction thereof for hansom or single brougham in the territory between Washington Square (below Eighth street) and Fifty-ninth street and the Hudson river and East river, and of \$2 for victoria or extension brougham.

The highest rates are charged for trips to suburban places just north of the limits of greater New York, such as Yonkers, Mount Vernon and New Rochelle, all approximately fourteen miles from the storage station. For such a trip, consuming eight hours, including privilege of a wait of three hours, the charges range from \$15 for a hansom or single brougham to \$45 for one of the largest 'buses or surreys.

How successful and popular the service has been may be gathered from the steady and rapid growth of the business. Starting modestly nine years ago with twenty vehicles and 12,000 square feet of floor space, the company now has 616 vehicles and occupies four stations aggregating nearly 200,000 square feet in area. It is incorporated with \$5,000,000 capital stock, and controls two subsidiary companies: the Park Carriage Company, incorporated with \$200,000 capital stock, and the Fifth Avenue Stage Company, incorporated with \$50,000 capital stock. The Park company operates nine four-seated electric surreys and six wagonettes in Central Park and on Riverside Drive and also two Gibbs forty-passenger electric and two Mack twenty-passenger gasoline sightseeing automobiles. The sight-seeing machines make hourly trips from Madison Square, some going downtown by way of Fifth avenue through Washington Square to Chinatown and Wall street, and others uptown by way of Fifth avenue and Riverside Drive to Grant's tomb. The round trip for either ride costs \$1 for each passenger.

The Coach company perpetuates the old blue horse-drawn 'bus service on Fifth avenue and Riverside Drive, probably more with the immediate object of keeping alive its valuable franchise than for the direct profit from these venerable vehicles. It has experimented expensively with motor 'buses, the latest being a combination gasoline-electric thirty-passenger stage that was put in operation last year. This has a street car type of body, built by a street car building company because the Transportation company was unable to find a coach builder who would undertake to build a suitable body. As a consequence the great weight of the vehicle makes it impracticable from an operative and economical standpoint.

Efforts are now being made by the New York Transportation Company to find a suitable type of automobile omnibus in Europe for service on Fifth avenue.

An important and rather significant extension of the business of the parent company was made on May 15 last, when it took over the entire "boarding" business of the Vehicle Equipment Company, at Ninth avenue and Twenty-seventh street. When the business changed hands about sixty electric delivery wagons and huge trucks of different types were regularly stored and cared for by the month at this station for the various large business houses that owned them. The New York Transportation Company leased the quarters and is now carrying on the business. There are charging plugs for forty vehicles at a time, with storage space for about seventy-five, and washing stands for two. The charges for storage, battery charging, cleaning and light running repairs range from \$50 to \$85 a month. Battery renewals, tire replacements and heavy repairs are not included.

Apart from the convenience of means of rapid transit more in keeping with the advancement in other lines of transportation than are the horse cabs and carriages of the last century, the electric vehicle service is of great importance to such a congested city as New York, where it displaces certainly no less than 2,000 horses and thereby makes for better sanitary conditions, cleaner streets and less noise.

"THREE MEN IN A"

This is the title of the book written by the ex-president of the A. C. A. and its covers contain much of interest. Primarily the story tells of Mr. Scarritt, but it also includes other interesting notes on the early days of automobilism.

In this pleasing manner Mr. Scarritt

To come off a stuffy transatlantic, murky, foggy weather, to feel the motor car out of its first turn of the crank; to glide out for an hour and find yourself in a country so much more so it would be Paradise—this whole time and expense of crossing the transportation Hill and the writer are traveling over the best macadam your Uncle Sam. But when the car really got straightened out on a road its well-trimmed green hedges on the fringe of deep red popples, "the sun" shining each other over billowy fields of broke forth and "Uncle John" opened he did not go faster over that smooth the motor car simply didn't have it.

The poet sings of "a perfect day" to find a perfect day in July on which familiar with Jersey roads (as well as compare them with the English highways) rarer than ours, but that is the only one. They are smooth, hard, and kept on an eighty-mile run to London we did not need attention. In Jersey we had it until finally it becomes impossible to find that in the care of roads, as well as things besides, a stitch in time saves highway is built on, or below, the road. In America we build the roadbed far from leave a ditch on either side. The road to freeze from—the top. Our American points, the top and both sides, are constantly breaking away. As a result keep the roads in condition. Our ninety-nine hundred years the start of us a leaf out of their book?

I wish I could paint for you the unbroken panorama on that delightful were floating lazily in a soft, deep, kept English farms were each out the whole landscape was a great for angels to play upon. Occasional wood, we would catch a glimpse of and floating above all—the English be waving with the English em Stripes. God grant that these two in every land where Civilization has

The farmhouses were neat, modern and gardens being as well kept as districts at home. In fact, the impression of being finished, with done until Gabriel blows his trumpet.

Of course, Mr. Scarritt entered France, and incidentally he surprised those who intend to tour abroad.

Before leaving Paris the motorist matter in America, should visit the ambassador and secure a passport. The man from Texas, with his gun, needs it very badly. The receipt officials at Havre for our deposit duty (to be returned to us when the country) embodied a description of number. This acted for us as a most important document when we went into Germany.

Many Americans buy new cars before leaving the city, to go to for a small fee, a "Descriptive Pavement of spirit and annoying

Another suggestion: Unless a French it is important that you French and English. We were a alert young man, Alexander Perish and excellent French. It is chauffeur's compensation, that



TIES OF THE AUTO CLUBS

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Wisconsin's Capital City Claiming Automobile Honors.

MADISON, WIS., June 4.—The Madison Automobile Club has one definite object in view, aside from promotion of friendly relations and opposition to unjust regulations, and that is the good roads movement. This step has elicited the approval and co-operation of Madison business men for they realize the benefits that would accrue to them if the highways were maintained in good condition. The capital city is located on a direct line from Chicago to St. Paul, a course frequently traveled, and complaints of parties en route to the Northwest will no doubt incite the club to action during the summer. H. H. Ratcliff is president of the club, and Dr. C. F. Harper, secretary and treasurer.

Keeping pace with numerous other cities in the state, Madison, the capital, has become an automobile city. It is reported that eighty cars are owned by residents of Madison, and the number is growing rapidly. It is interesting to note the claims made by various Wisconsin cities as to superiority in point of numerical strength of the automobilists. First of all it was Racine that endeavored to explain that, considering its population, it was the possessor of the greatest number of autos. Then came Marinette and Menominee and now Madison thinks it should be given first honors. The latter is probably in a better position to substantiate its claims than the other cities named, inasmuch as its population of 20,000 inhabitants own eighty cars, or a car for every 400th person, while the nearest competitor, Racine, claims one car for every 500th person.

Minneapolis A. C. Gains 100 New Members in a Month.

MINNEAPOLIS, MINN., June 4.—Membership in the Minneapolis Automobile Club is rapidly increasing. In the past month close to 100 new members have been secured. The campaign which the membership committee has been carrying on was greatly assisted by the club's securing new rooms in the Plaza, and by requiring those who desired to enter the hill-climbing contest to be members. Opening night, which occurred the day before the hill climb was run, 23 members were added to the rolls. The active interest that the club has displayed in securing fair and just legislation from both the Legislature and the City Council has also had a stimulating effect.

The city ordinances require that purchasers of automobiles take out licenses whether they have secured them the year previous or not. The automobile club took the matter to the attorney general and secured an opinion to the effect that those who took out licenses from the state boiler inspector last year were immune from the ordinance. The club has also done considerable to prevent the police from exercising unreasonable authority.

Vancouver Island Autoists Invite American Tourists.

VICTORIA, B. C., June 1.—At the request of the Victoria Auto Club the Canadian Pacific Railway is considering the inauguration of cheap week end trips for automobilists and their machines from Seattle. This would be enjoyed by autoists of the entire Puget Sound country. A low rate would prove a good thing, especially for Seattle, which has no good road system in its immediate vicinity, while the roads about Victoria are among the best in the country.

Victoria enjoys a unique advantage by its insular situation. Under the customs regulations, automobiles brought into the Dominion by tourists, the collector can exercise discretion by giving the usual deposit of \$25 when satisfied that the machine will be used only within the limits of the port vicinity. This city is the only port in which discretion can be exercised liberally, and the car may be sold and transported to other

PENALTIES OF MASSACHUSETTS LAW

BOSTON, June 4.—Automobilists of this state are particularly concerned regarding the penalty portions of the new law, and those who intend to visit the state would do well to familiarize themselves with the new conditions. The heavy part of the new penalty clause of the law is aimed at persons who operate, "recklessly or while under the influence of intoxicating liquor, or so as to endanger the lives or safety of the public." A conviction under this section means a fine of not over \$100 or imprisonment not exceeding six months. In addition the offender loses his license for at least sixty days, and if he is the owner of the car, his registration certificate for the same time. The dealer is under the same obligations as others, and if he is convicted, his cars are all put out of business for two months. It is also made an offense to attach the wrong number plate to a car, or to obscure a number plate with intent to conceal the identity of the vehicle. Hereafter, moreover, everybody who is haled into court will have his name down on the records kept by the Highway Commission, whether or not he is convicted, for the new law reads that courts must report the cases of everybody who is "charged" with a violation of the law. Before they reported only convictions and "nolo contendere" cases were not reported.

It is confidently predicted that the new law will cause much dissatisfaction among the landlords of summer hotels, especially those in the western part of the state, who are accustomed to entertain a great many guests from other states. Until this law was passed a man from New York could drive his car under its New York license for 15 days in Massachusetts, and did not have to apply for a Massachusetts license within that time. This allowed for a very respectable vacation, so that few out-of-state cars were registered. The Highway Commission was dissatisfied with this state of affairs, and the legislature has reduced to seven days the time during which an out-of-state automobile can be driven under its home number.

An attempt was made by the automobile clubs and associations this year to have rescinded that part of the law passed last year which gave the towns and cities the right to make local speed regulations. It was found very quickly, however, that a bill with such a provision would meet an untimely death at the hands of the up-country legislators, so it was sacrificed in the interest of the increased speed. The automobilists were able, however, to have the law amended so that now they have 60 instead of 15 days in which to enter a protest against local regulations and secure a revision of them by the Highway Commission.

Two entirely new sections, intended for the assistance of the police in making arrests and securing evidence, are a part of the new law. One of these sections provides a fine of from \$25 to \$100 for any person who, while operating a car, refuses, when asked by a police officer, to give his name and address, or the name and address of the person owning the car, or who refuses to stop when signaled to do so by a police officer in uniform or who displays a badge conspicuously, or who refuses to produce his license and registration certificate when requested to permit the officer to examine them. Similar punishment is provided for a person owning or controlling a car, who refuses to give a police officer such information as he can. It is provided in this connection, however, that evidence obtained in this way cannot be used in any criminal prosecution against the person furnishing it.

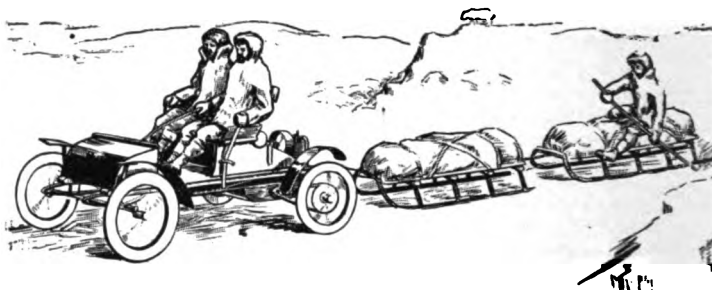
While the new law does not compass everything that the automobilists could wish, and contains some things that they would have had left out, had they had their own way exclusively, it is considered, for a compromise measure, to be very satisfactory indeed. The automobilists have gained important points and the things they have had to concede to the other side bear hardest upon that class of drivers who do most to bring the whole body of automobilists into disrepute with the rest of the community.

ACROSS GREENLAND'S INLAND ICE.

Through the Denmark expedition, the automobile will make its entrance into Greenland, Mylius-Erichsen, the Danish explorer, and head of the expedition, having ordered through Carl Joh. Janssen, Vertergade, an automobile of the buckboard type from the Waltham Manufacturing Company, of Waltham, Mass.

In the spring of 1902, at the time preparations were made for the Greenland expedition, Mylius-Erichsen thought seriously of procuring an automobile to take along with him. Not only did he expect to use it on the sea ice, which, as a rule, is uneven, but he thought that in the interiors of the fjords, where the ice was level, it would prove of great service. At that time, however, Erichsen did not possess the extra means to procure the car, and at any rate his automobile idea was regarded as impracticable by the technical experts of the expedition. Two and one-half years' experience in Greenland has demonstrated that Erichsen was right in his conclusions. Not only does the ice lay smooth and even throughout the winter in the deep inland fjords, but after the summer season is commenced, is covered with a firm, smooth coating of driven snow. He also examined the inland ice on the Greenland plateau, and found that through certain months it would be available for automobile riding, provided he could get the car up into these heights.

The expedition's new automobile, though of the buckboard type, will be modified in several ways from the stock model,



HOW THE ORIENT BUCKBOARD WILL LOOK EN ROUTE.

to meet the requirements to which it will be put. It will weigh only 550 pounds and have a 4-horsepower motor. The *Politiken*, of Copenhagen, in speaking of the plans of the expedition, says: "Only one man is to be seated in the car, which is to be used for hauling goods and moving to provision depots, and all of the goods that cannot be placed on the automobile itself will be brought on broad-gauge sleighs of the Nansen type, which are to be towed after the car. The gauge of the car is very broad, so that it will not easily upset, and the whole machinery is simple and well covered. As gasoline freezes at about 40 degrees Centigrade cold, and is probably a still heavier cold can be expected, there will be made an arrangement for warming purposes worked with pure alcohol, which only freezes at a lower temperature, and by means of which the gasoline will be kept liquid in the tank. Around the rubber tubes of the wheels there is not a rubber cover, which would break in the cold, but a cover of leather or linen. The car will be arranged to be placed on sleigh runners, so it can be drawn by dogs and men if loose snow is met with. It is the intention all the time to have dogs beside the car, so that it can always be transported if the machine should break. There is no doubt that the automobile can be used to advantage on the East Greenland fjords, which are often twenty and thirty Danish miles long (a Danish mile is equal to 4 1/2 English statute miles), where the ice will be lying even and smooth for months, and if Erichsen succeeds in bringing the car up the valleys of the glacier territory to the plateau, he will also try to drive it over the never-crossed northern ice of Greenland's upland region."

SUMMER ACTIVITIES OF THE AUTO CLUBS

A Notable Holiday Run of Washington's Club.

WASHINGTON, D. C., June 4.—Several members of the Automobile Club of Washington participated in a run to the Gettysburg battlefield on Decoration Day, among those taking part being C. Royce Hough and party in a Pope-Toledo; Captain Caverly and three guests in an Oldsmobile touring car; H. C. Hunter and C. Bivins, in Franklins; and Ed. Terry in an Oldsmobile runabout. At Frederick, Md., the party was joined by a number of Frederick automobilists, including Dr. McCurdy and Eugene Groves in Pope-Tribunes; Holmes Baker and D. Guy Thomas in Stanley steamers, and Kelly Robinson in a Locomobile.

The distance from Washington to Gettysburg by way of Frederick is approximately 86 miles, and, with the exception of a 10-mile stretch between Emmitsburg and Gettysburg, the roads are fine. The Frederick pike runs through Frederick county, one of the finest sections of Maryland, and is one of the best macadamized roads in this part of the country. The scenery all along the route is incomparable and the wonder of it is that this trip is not taken more frequently by automobilists. The Gettysburg national park embraces an area of 25 square miles and within the confines of the park are miles upon miles of the finest Telford roads that the government has built at a cost of \$8,000 a mile. The round trip was made with no untoward incidents, there being absolutely no mechanical or tire troubles. This is the longest run the club has yet taken, and it is Captain Caverly's intention to get the members out on runs as often as possible.

Labor Day Road Tour for the Chicagoans.

CHICAGO, June 4.—A road tour on Labor Day will be given by the Chicago Automobile Club, and the members of the club's racing board are looking about for a suitable course. There is a twenty-two mile straightaway in Lake county which may prove to be available and the board will look it over in the near future. At the recent directors' meeting it was also proposed to hold a "rational" race, to extend fifty miles through the business and residence portions of the city. It was suggested that the local speed laws be lived up to in this contest, stops made at various stores, and the race decided on the economy of gasoline consumption. This plan was filed by the racing board, but was not looked on with much favor by the directors. They also turned down the idea of holding another race meet at the Harlem track.

Chicago has the first entry to the Glidden tour. N. H. Van Sicklen, a director of the Chicago Automobile Club, forwarded his nomination and entry fee last week and has been given No. 1. He will lead the tourists out of the city.

The rapid growth of the Austin Automobile Club has brought out the suggestion that each of the important centers composing the environs of Chicago organize clubs to work in concert with the Chicago Automobile Club for auto-biling interests. Oak Park, Riverside, Lagrange, Berwyn, Kensington, Pullman, South Chicago, Winnetka, Glencoe, Highland Park, Lake Forest, Wilmette, Evanston, and others are fruitful centers for local organizations, which can exert a powerful influence working together.

Alfred N. Chandler Organizing a Quaker Aero Club.

PHILADELPHIA, June 4.—Philadelphia is to have an aero club. Notices have been sent out by Alfred N. Chandler, who recently made a successful trip to South Amboy from this city, asking prospective air navigators to send in their names to him at the Union League Club. Next Saturday there is to be a balloon race here, the start to be made from the U. G. I. athletic grounds at Point Breeze. Chandler's *Initial* and the *Orient*, a gas bag owned by members of the Aero Club of America, both manned by professionals, will start.

Wisconsin's Capital City Claiming Automobile Honors.

MADISON, WIS., June 4.—The Madison Automobile Club has one definite object in view, aside from promotion of friendly relations and opposition to unjust regulations, and that is the good roads movement. This step has elicited the approval and co-operation of Madison business men for they realize the benefits that would accrue to them if the highways were maintained in good condition. The capital city is located on a direct line from Chicago to St. Paul, a course frequently traveled, and complaints of parties en route to the Northwest will no doubt incite the club to action during the summer. H. H. Ratcliff is president of the club, and Dr. C. F. Harper, secretary and treasurer.

Keeping pace with numerous other cities in the state, Madison, the capital, has become an automobile city. It is reported that eighty cars are owned by residents of Madison, and the number is growing rapidly. It is interesting to note the claims made by various Wisconsin cities as to superiority in point of numerical strength of the automobilists. First of all it was Racine that endeavored to explain that, considering its population, it was the possessor of the greatest number of autos. Then came Marinette and Menominee and now Madison thinks it should be given first honors. The latter is probably in a better position to substantiate its claims than the other cities named, inasmuch as its population of 20,000 inhabitants own eighty cars, or a car for every 400th person, while the nearest competitor, Racine, claims one car for every 500th person.

Minneapolis A. C. Gains 100 New Members in a Month.

MINNEAPOLIS, MINN., June 4.—Membership in the Minneapolis Automobile Club is rapidly increasing. In the past month close to 100 new members have been secured. The campaign which the membership committee has been carrying on was greatly assisted by the club's securing new rooms in the Plaza, and by requiring those who desired to enter the hill-climbing contest to be members. Opening night, which occurred the day before the hill climb was run, 23 members were added to the rolls. The active interest that the club has displayed in securing fair and just legislation from both the Legislature and the City Council has also had a stimulating effect.

The city ordinances require that purchasers of automobiles take out licenses whether they have secured them the year previous or not. The automobile club took the matter to the attorney general and secured an opinion to the effect that those who took out licenses from the state boiler inspector last year were immune from the ordinance. The club has also done considerable to prevent the police from exercising unreasonable authority.

Vancouver Island Autoists Invite American Tourists.

VICTORIA, B. C., June 1.—At the request of the Victoria Auto Club the Canadian Pacific Railway is considering the inauguration of cheap week end trips for automobilists and their machines from Seattle. This would be enjoyed by autoists of the entire Puget Sound country. A low rate would prove a good thing, especially for Seattle, which has no good road system in its immediate vicinity, while the roads about Victoria are among the best in the country.

Victoria enjoys a unique advantage by its insular situation. Under the customs regulations, automobiles brought into the Dominion by tourists, the collector can exercise discretion by waiving the usual cash deposit of \$25 when satisfied that the machine will be used in Canada only within the limits of the port of importation and its vicinity. This city is the only port in British Columbia where such discretion can be exercised liberally, as there is little fear it could be sold and transported to other parts of the Dominion.

Boulevard to Salt Lake Backed by New Club.

SALT LAKE CITY, UTAH, June 2.—Building an oiled boulevard from Salt Lake to Saltair, and a general campaign for good roads throughout Utah are the leading objects of the Salt Lake Automobile Club, which has just been organized in this city. Heretofore Salt Lake has been shunned by automobile tourists owing to the poor condition of the roads throughout this neighborhood. It is to encourage more tourists to make the trip to this city that the oiled road will be made, with the better roads through the state, which is expected to grow out of the campaign of the local club. A well-graded, oiled thoroughfare about forty miles in length is the dream of the club.

Following the lead of Salt Lake City, it is probable that similar clubs will be formed in other cities in the state where automobiles have been purchased in any numbers. A careful canvass of this city shows about 160 cars are owned here. The new club starts off with a membership of seventy-five.

Californians Renew the Struggle for Good Highways.

SAN FRANCISCO, CAL., May 31.—Despite the unsettled conditions obtaining in this city and vicinity, owing to the recent earthquake and disastrous fire, automobilists are looking beyond the mere utility of their machines and planning for the future. The greatest need at the present time is a satisfactory highway from this city to the southward in San Mateo and Santa Clara counties. R. P. Schwerin, of the Automobile Club of California, has been the leading spirit in raising subscriptions for the construction of a boulevard from San Francisco to Colma. He has the solid backing of the club behind him, and the subscriptions already received will do all the work in San Mateo county.

The automobile occupies a warm spot in the affections of Californians owing to the great work of relief it performed after the recent catastrophe, and it is safe to say there will be no unnecessary restrictive legislation enacted to annoy the automobilists of this state in the immediate future.

CLUB DOINGS IN GENERAL.

OSHKOSH, WIS.—At the adjourned annual meeting of the Oshkosh Automobile Club, the following officers were elected for the ensuing year: President, C. O. Josslyn; vice-president, Edward Krueger; secretary, F. E. Waite; captain, A. H. Meyer; treasurer, L. Frank Gates.

UTICA, N. Y.—The Automobile Club of Utica has appointed a committee to arrange for the reception of the Glidden tourists during the run in July. This city has been named as one of the night stations of the tour, and every effort will be made by the local club to make the tourists' brief sojourn here as enjoyable as possible.

CINCINNATI, O.—The success of the recent Paddock hill climb under the auspices of the Automobile Club of Cincinnati has given an impetus to club life in this city, and the next thing on the program is the establishment of a garage for the exclusive use of members of the club and their guests. The matter will be considered at the next meeting of the club.

PROVIDENCE, R. I.—Instead of holding its customary race meet this season, the Rhode Island Automobile Club has under consideration the running of a two-gallon efficiency contest similar to that recently held by the Automobile Club of America in New York. As yet the plans have not taken official form, but are being considered by the board of directors.

PORTLAND, ORE.—To build a road to Mount Hood, so that the trip from Portland to the snow-capped peak and return can be made in a day, is the object of the Portland Automobile Club. A committee of ten has been appointed to take charge of the project, and an appropriation of funds to carry on the

preliminaries was authorized at the May club meeting. Eleven new members were elected at the meeting.

DETROIT, MICH.—Members of the Detroit Automobile Club have undertaken the task of making the road from this city to Pine Lake, where the clubhouse is located, a model highway. A fund of \$1,000 has been subscribed for the purpose of scraping and graveling the road after every rain. With the work systematically carried out, automobilists say that it will soon become one of the finest stretches of highway in southern Michigan.

BLOOMINGTON, ILL.—Secretary Henry Throbro, of the Bloomington Automobile Club, states that the former hostility shown in that city and the surrounding country against automobilists has given way to a friendly feeling, because the club members are observing the laws, and have done all in their power to suppress reckless driving and other infractions of the motor laws. The club now has over fifty members.

MONTREAL, CANADA.—Leading city officials, including the mayor, board of aldermen, and the heads of the civic departments, were the guests of the Automobile Club of Canada on its first club run held recently. With the evident intention of showing the officials the unsatisfactory condition of the streets, the route out of town included some streets that were in bad condition. President McDonald welcomed the guests at the Hunt Club, the termination of the run, where a collation was served to all participating, prior to the return trip.

BUFFALO.—At a meeting of the membership committee of the Automobile Club of Buffalo 26 applications for membership were favorably acted upon. This makes 65 new members that have been elected in the last 30 days, and the club is making a strong effort to induce every automobile owner in the city to join it. Mayor Adam has been notified by the board of directors of the Automobile Club that the club will support him in keeping a complete list of the names, addresses, and license numbers of automobilists in Buffalo. The club will report to the mayor the registration of each additional machine. Mayor Adam proposes to have a list of the motorists on file in each precinct station house.

WITH THE MOTOR BOATISTS.

BUFFALO.—The Motor Boat Club of Buffalo is planning a motor boat race over its official course in the Niagara river, August 4. Commodore Glasgow has announced that he will present a handsome challenge cup to the club, to be raced for by boats making over ten miles per hour, the race to be open to members of any recognized club. The race will be the first held under the new National Motor Boat Association rules. The club's course is 15 miles, and triangular. The cup is to be the property of the winner for one year, but if won three times by the same boat owner, not necessarily in succession, it becomes the property of the winner. Entries will close July 28.

NEW YORK.—At the last meeting of the board of governors of the Motor Boat Club of America, the matter of site for a new clubhouse was referred to the committee on ways and means. Three sites have been offered, and the committee will make a report at the next meeting of the board. The regatta committee, in arranging dates for the season, has accepted the invitation of the Business Men's Association of Newport, R. I., to make that city the terminal of the club's cruise, in time to participate in the Newport carnival, August 6-11. All motor boat clubs and owners will be invited to participate in the cruise. A committee was also appointed to confer with the officers of the National Motor Boat Association with a view to securing the national motor boat carnival in the fall.

NEW EXPANDING RING BRAKES AND CLUTCHES

THERE is no part of the automobile that has not been greatly improved since automobile building became a recognized industry; but some have inevitably received more attention than others. Among the comparatively inconspicuous parts that have not, perhaps, received the full measure of attention to which they are entitled may be mentioned the brakes, and the clutch also frequently leaves room for improvement. Now that the automobile, as a whole, has been

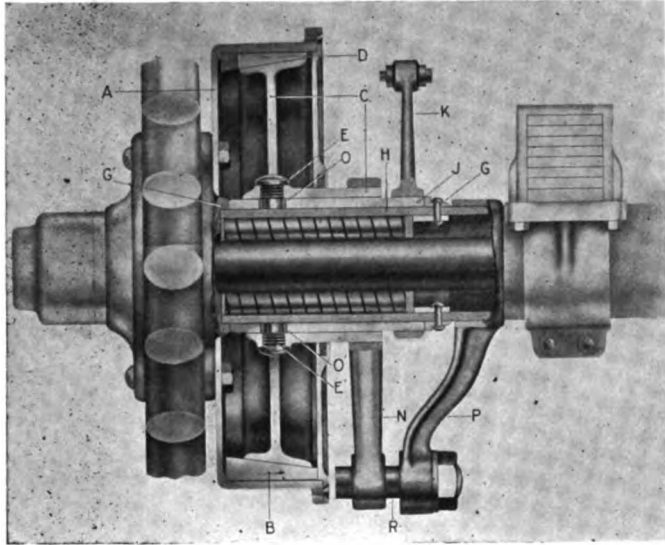


FIG. 1.—STANDARD EMERGENCY HUB BRAKE.

brought to a comparatively high state of efficiency, manufacturers are finding more time to devote to the development of details, and among those who concentrate their energies on details exclusively is the Standard Brake Company, of 101 West Sixty-sixth street, New York, a concern manufacturing brakes and clutches. Some decidedly interesting mechanical features are involved in the Standard devices, as the following description shows.

Fig. 1 shows a Standard emergency brake applied to the hub of a rear wheel with dead axle. The brake is of the internal expanding type, a split ring being expanded against the inner surface of a drum by a cone. In Fig. 1 B is the ring, the inner surface of which is beveled to conform to the taper of the cone C. The cone is mounted on a sleeve J, which is held from turning by the arm N, through a hole in which passes the stud R in the arm P, the latter being



FIG. 2.—SLOTTED SLEEVE AND SCREW

by means of the arm K. A spiral slot in sleeve J engages the ends O of screws E passing through the cone sleeve C. When the arm K is moved so as to partly rotate the sleeve J the screws E and the cone and sleeve C are caused to move along the shaft, being prevented from rotating by the arm N, while the sleeve J is held against end motion by the collars G G. Fig. 2 shows the sleeve J, the sleeve slot and a screw on a larger scale; the screw has a hardened steel roller on the end to minimize wear and friction. A wedge D, Fig. 3, holds the ring B in one place on the cone. The wedge, fast on the cone, advances with the

cone and fills the gap in the ring as it widens, making the ring practically continuous and unbroken. The pitch of the slot in the sleeve J determines the distance through which the driving cone C shall move when the arm E is caused to move a given distance. Wear can readily be taken up by moving arm K until the cone is advanced sufficiently to take up as much as is necessary.

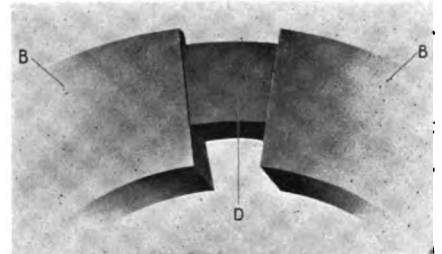


FIG. 3.—RING ENDS AND WEDGE.

The Standard brake for countershaft or propeller shaft is of smaller diameter than the hub brake, but the frictional surfaces are wider to compensate. The cone moves in a direction the reverse of the emergency brake cone; otherwise the construction is the same in both and further explanation is unnecessary.

In the construction of the Standard clutch, shown in Fig. 4, a driving cone and expanding ring are used, as in the brake, but the cone is driven in by means of a sliding sleeve with ball thrust bearing. The illustration is clear and self-explanatory.

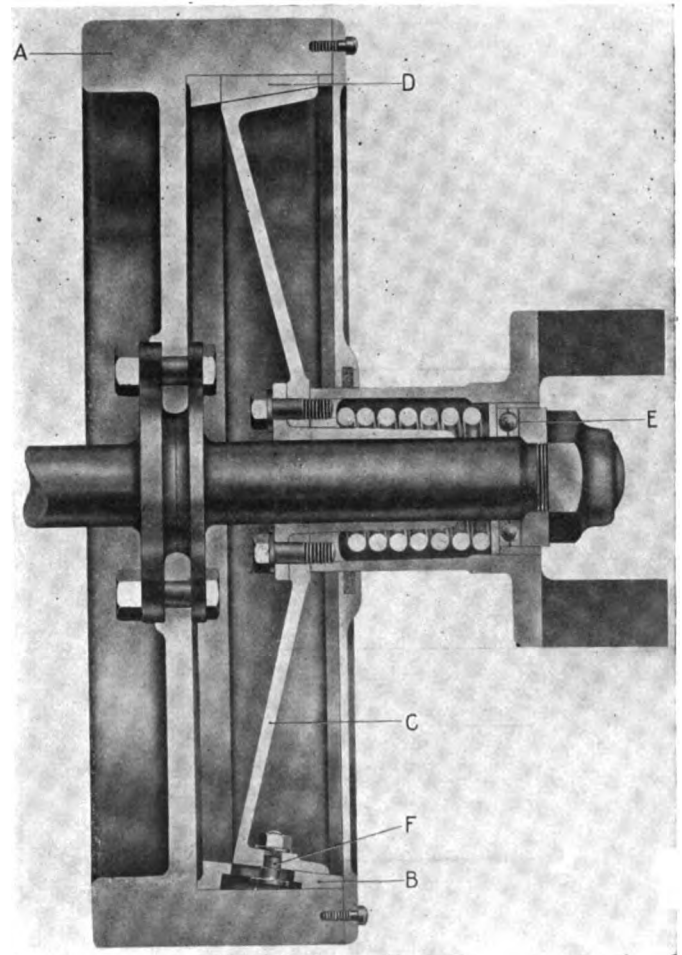
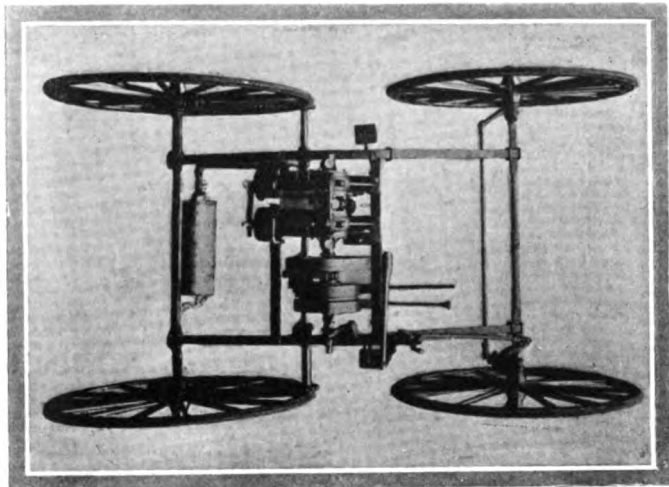


FIG. 4.—STANDARD CLUTCH WITH RELEASING DEVICE.

A—Flywheel. B—Expansion Ring. C—Driving Head. D—Wedge.
E—Spring Thrust Bearing. F—Retaining Stud.

A NEW TWO-CYCLE CAR.

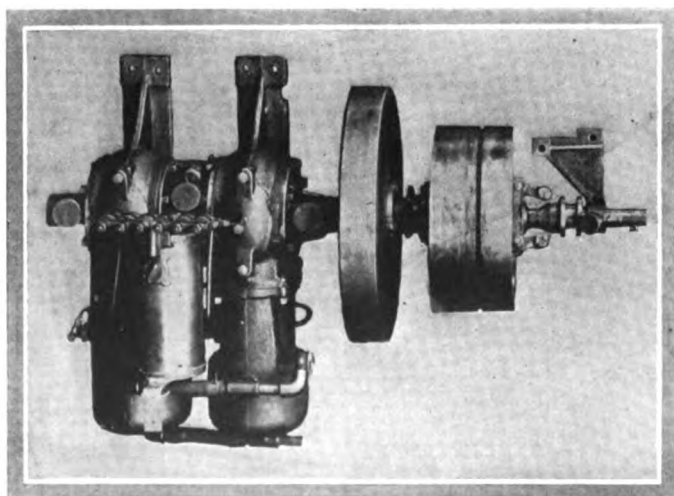
Two-cycle motors for automobile work are becoming more popular, though not long ago there was only one concern making a success of automobiles equipped with this type of motive power. The latest two-cycle machine is that manufactured by the Dayton & Mashey Automobile Works, 4,515 Evans avenue, Chicago, and is called the Reliable Dayton. The motor has two horizontal water-cooled cylinders hung



CHASSIS OF "RELIABLE DAYTON" CAR.

from the frame under the body; the cylinders are of 3-1-2 inches bore and stroke and are placed side by side. With this arrangement the crankshaft receives an impulse every half revolution—the same as a four-cylinder four-cycle engine.

The machine has a light frame and is mounted on high wheels with 11-8-inch solid rubber tires; the wheels are 40 inches and 44 inches in diameter, front and rear respectively. The wheels are driven by chains from a countershaft; the countershaft, in turn, is driven by a single short chain from the two-speed planetary transmission mounted on the engine shaft and the countershaft carries the differential. The whole



TWO-CYCLE, TWO-CYLINDER MOTOR.

chassis is extremely simple and compact. The transmission is said by the manufacturers to be exceedingly substantial.

The body is of the piano-box type, with seat 42 inches long, upholstered in leather. A leather dash is placed vertically in front and is 11 inches high. Side springs 72 inches long carry the body and make a comfortable suspension. Low speed and reverse are controlled by pedals; the high speed is engaged by a side lever. The throttle lever is at the end of the seat.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Tours.

- June 12...—Chicago, Orphans' Day. Annual Run by the Chicago Automobile Club.
- June 14...—Buffalo, N. Y., Illuminated Parade, Automobile Club of Buffalo.
- June 14...—Baltimore, Md., Orphans' Day, Second Annual Celebration, Automobile Club of Maryland.
- June 16-18—Three-Day Tour, Bay State Automobile Association, Boston to Rye Beach, N. H.
- June 18-23—Second Annual Economy Test, New York Motor Club.
- June 21-26—Second Annual Tour, Albany Automobile Club, Albany to Boston and return.
- June 23...—Rochester, N. Y., Automobile Floral Parade at Genesee Valley Park, Rochester Automobile Club.
- July 12...—Annual A. A. A. Tour, Chicago to Bretton Woods, N. H., Rules for the Glidden Trophy operative from Buffalo.

Race Meets and Hill Climbs.

- June 9...—Hohokus, N. J., Second Annual Race Meet of the North Jersey Automobile Club (Robert Beattie, secretary, Little Falls, N. J.).
- Sept. 2...—100-Mile Road Race, on 25-Mile Circuit in Monroe County, N. Y. Rochester Automobile Club and New York State Automobile Association.
- Sept. 22...—American Elimination Trials for Vanderbilt Cup Race (Long Island Course Probable).
- Oct. 6...—Vanderbilt Cup Race, American Automobile Association.

Motorcycle Tours and Contests.

- July 3-7...—Annual Endurance Run and Meet, Federation American Motorcyclists, Rochester, N. Y.
- July 4...—Tour to Rochester, N. Y., New York Motorcycle Club
- July 4...—Race Meet, Milwaukee Motorcycle Club.
- Sept. 3...—Race Meet, Muskegon (Mich.) Motorcycle Club.

Motor Boat Races.

- June 16...—Knickerbocker Yacht Club Race, Marblehead, Mass., to College Point, L. I.
- July 9...—Toledo Yacht Club, Open Long Distance Race for Cruising Motor Boats, 119 3-4 miles.
- July 13-21—Annual Cruise American Power Boat Association, Port Washington, L. I., to Shelter Island, Stopping at Norwalk, Thimble Islands, New London, Newport and Block Island.
- Aug. 4...—Buffalo, Motor Boat Club, 15-mile race for Glasgow Cup, on Niagara River course.
- Aug. 21-23—Gold Challenge Cup, American Power Boat Association, on St. Lawrence River at Chippewa Bay.

FOREIGN.

Shows.

- Oct. 5-14—Leipzig (Germany) Exhibition, Krystall Palast.
- Nov. 1...—New Zealand International Exhibition opens at Christchurch.
- Nov. 1-16—Berlin (Germany) Automobile Exhibition.
- Nov. 15-24—London, Olympia Motor Show.
- Nov. 23-Dec. 1—London, Stanley Show, Agricultural Hall.

Tours.

- June 5-13—Herkomer Cup Touring and Speed Trials, Munich, Bavaria.
- June 11-16—Land's End to John O'Groats. Auto Cycle Club of Great Britain.
- June 13-16—Scottish Reliability Trials.
- July 26-Aug. 15—Circuit Européen, 3,000 miles, Paris, Milan, Vienna, Berlin, Cologne, Paris.

Races, Etc.

- June 26-27—Le Grand Prix, Sarthe Circuit, France.
- July 8...—International Cup Race for Motorcycles, Cesky Club Motorcyclistu of Austria.
- July 15...—Suze-Mont Cenis Hill Climb (Italy). Automobile Club of Turin.
- Aug. 1-15—Circuit des Ardennes (Belgium).
- Aug. 9-12—Malchamps (France) Hill Climb Tests.
- Aug. 15-16—Ventoux (France) Automobile Meeting.
- Aug. 14-19—Ostend (Belgium) Meet.
- Aug. 18...—Liedekerke Cup Race.
- Aug. 23...—Semmering Hill Climb.
- Aug. 27-Sept. 2—Brescia (Italy) Automobile Meeting.
- Sept. 27...—Tourist Trophy Race, Isle of Man, A. C. of Great Britain.
- Oct. 7...—Chateau Thierry (France) Hill Climb.
- Oct. 28...—Gaillon (France) Hill Climb.

ACROSS PORTO RICO IN AN AUTOMOBILE

By ARTHUR H. DENISON.

PORTO RICO is almost an ideal place for the motorist.

Its roads, the finest in the territorial limits of the United States, extend right across the island. From San Juan to Ponce is a trip of eighty miles through a picturesque country—beautiful mountain scenery and wonderful feats of road building. The natives, half shy, collect in groups to see the car pass by, and drivers of ox-carts wake up when the car is a short distance away, and tug and prod at their stupid beasts in an effort to give you the road. Porto Rico has no speed laws in the open country, but San Juan, an old Spanish town, with narrow streets, I understand, has recently passed a speed limit of three kilometers (1 7-8 miles) an hour in the city proper, and automobiles are not allowed on certain streets. The one drawback at present is the lack of supplies; not even a tire pump can be purchased here at present, but as cars are coming in at short intervals it is to be hoped that some large American supply house will put itself in a position to supply the demand. The climate is decidedly warm, being between 90 and 100 degrees in the shade, but the heat is tempered by the trade winds that blow constantly from the east. The buildings, streets and roadways are of stone, brick or plaster, and on a very bright day the glare is very trying on the eyes.

The roads, I understand, are built of broken stone, in applications of different sizes and finished with a binding material and steam roller until the surface is unequalled by anything except asphalt. The dust which soon collects, when treated to a tropical shower, makes the use of non-skids imperative. Convict labor is used to quite an extent to prepare the stone.

Traffic on the island is, to a large extent, carried on by means of ox-carts, drawn by two or four oxen. These clumsy vehicles are invariably on the wrong side of the road and their drivers asleep or dozing, and it is pretty risky to drive round a turn without the car in good control. The lower classes will not move out of the way until the instinct of personal safety overcomes their natural laziness, still they are learning. Their attitude is friendly and curious, and when our car is stopped in a town it is soon surrounded by a wondering crowd.

The trip from San Juan to Ponce is about eighty miles. As the bird flies it is about southwest, but with a compass I am afraid the instrument would soon be in need of new jewels. The trip in our powerful car is a pleasant four to five hours' ride. From San Juan to Rio Pedras, the first town, is about eight miles, the road being level and passing for more than half the way through villages that exist only on the roadside. From Rio Pedras to Caguas, the next town, is about fifteen miles further, the road is up and down hill, the steepest grades being possibly over 20 degrees and the road is nowhere straight for more than 400 yards until within a few miles from Caguas, and the turns are frequently sharp and occasionally double. One-half mile from Caguas is a creek locking a bridge at present, and the only way to pass is to pass through. So while a crowd of wondering natives watch, we drop into our lowest gear, and into the river bed, then the engine given a high spark and pin throttle, rushes through, sometimes stopping on the incline up the other side to allow the water to dry off the plugs, other times with never a stop, and soon we are in Caguas, a pretty town in a beautiful valley. Leaving there the road is level for a few miles, and then we begin to climb and for five miles we are going up hill, up grades as high as 22 degrees incline. Our car takes them easy on the third speed, with lots of power in reserve. After climbing in all about 1,500 feet and a slight drop of perhaps 100

feet, we enter Cayey, noted for its fine tobacco. Here the road branches—ours to Ponce going through the town, the other leading south to Guayama. Leaving Cayey, we drop nearly 300 feet and then start to climb again, and in the next ten miles we climb nearly 1,600 feet, winding up the sides of the mountains, parts of the road visible four and five miles ahead. On the right is a beautiful valley that was, two months ago, covered with tobacco grown under cheesecloth, many acres being treated thus, producing some of the finest flavored tobacco known. Ailoneto, about fifteen miles from Cayey, is about the highest point on the road, being at an altitude of about 2,800 feet. A few miles further we have to go down this height in 4 1-2 miles. The turns and twists are endless, the scenery magnificent, and the road said to be one of the most wonderful examples of road building in the world. Some of the turns are so short that one thinks as the car swings round that our front wheels have designs on the tail lamp. In one place there are three sections of the road visible below. The grades run as high as 25 degrees frequently, and on turns



AT AILONETO, FIFTY MILES FROM SAN JUAN.

where if the road could be laid down level the inside edges would be within three feet of each other. The road itself is about fifteen feet wide, and on the outer edge is a precipice hundreds of feet deep.

Coamo, the next stop, is a few miles from the foot of the hill, and from there to Ponce, about twenty-two miles further, the roads are pretty straight, and good time can be made. Several rivers have to be crossed that now, during the rainy season, are beginning to hold water, at other times they are rough and dry. The bridges have been washed away and not rebuilt, yet other portions of the road show examples of fine stone bridge building. Ponce is one of the busiest cities and is a very pretty place. An electric road connects it with the ocean three miles away, where quite extensive shipping facilities are in use. The Hotel Frances is very good and its table is one of the best in the tropics.

Our car, a 1906 Thomas Flyer, has covered about 900 miles in the first month, and the only trouble so far has been the ground wire becoming detached. I have used one set of brake leathers. The safety backstop device is invaluable in a hilly or mountainous country. The car has climbed all hills on the fourth or third speed, on the third with the throttle never more than one-third open, and as for ease to handle, she is all I can expect.

SIX-CYLINDER NAPIER'S RUN.

A high-gear trial run of 1,000 miles by a 60-horsepower six-cylinder Napier touring car was recently completed in England, and some interesting figures resulted. The stops made involuntary included the loss of 54 minutes because of the



CECIL EDGE IN 60-HORSEPOWER GEARLESS NAPIER.

loss of the carbureter drain plug, 30 minutes readjusting the contact breaker and changing batteries and 2 hours 7 minute owing to the bursting of two tires, but none due to the high gear. The car averaged 8.98 miles to a gallon of gasoline, using altogether 113 gallons. The slowest speed was 4.45 miles an hour, over a measured quarter mile; the gear ratio being 3.09 to 1, the engine was making 132 revolutions a minute at this speed. The car was run at its maximum speed on a track and, with the engine turning up 1,756 revolutions a minute, traveled at the rate of approximately a mile a minute. During the run the clutch was slipped only in one or two cases where the road was blocked by traffic. The total weight of car and passengers was about 4,500 pounds. The run was made under observation of an official appointed by the A. C. G. B. I. and the car was driven by Cecil Edge.

GENERAL FUNSTON'S AUTO RELIEF CORPS.

Immediately following the earthquake at San Francisco, General Funston, who was in command of the United States military forces quartered there, assumed charge, and purchased for relief work twelve Cadillacs, nine of which are shown in the photograph. The picture was taken at Fort



Mason, General Funston's headquarters, after the stress of the relief work was over, and is interesting in view of the great work performed by automobiles in saving lives and personal property from the flames which followed the seismic shocks.

PENNSYLVANIA HOLD-UP GAME.

Editor THE AUTOMOBILE:

[334].—Automobilists whose homes are outside of Pennsylvania will do well to read this outline of the hold-up game which I met with in Portland, Pa.

Portland is a very small village about three miles beyond Myers Ferry, on the main route (and only route) from New York and New Jersey to the Delaware Water Gap.

Every automobile that has passed through Portland this spring has been stopped, and unless carrying a Pennsylvania license, and Pennsylvania numbers back and front, and no other numbers, the owner or operator has been fined \$10 and costs, total in every case \$11.85. There is no chance of escape, either, as the chief of police, in uniform, stands in the middle of the road at a narrow point, and an old wagon pulls out from the side and completely blocks the way, the Chief throws up his arms and calls to stop. And you have to, whether you want to or not.

Then the farce begins. He asks if you carry Pennsylvania numbers; you reply "No." Then he says he must demand to see your Pennsylvania license; you admit having none; then he orders the car into a side street and sends for the justice of peace. They hold office in an old barn, read you the law, and fine you.

In my case I told them I would turn back, that I had intended spending Sunday at the Gap, but would not stand for treatment like this; but the justice of the peace said: "Oh, you can go on; when you come back we won't hold you up again." So, rather than spoil our trip, we did so, and found that every car at the hotel had been held up as we were, also those that followed us, and I also discovered that all cars passing through Portland this season had met the same fate.

For the benefit of all who may intend taking the run this season, I hope you will see this gets wide publicity. The law is a new one and went into effect January 1.

New York City.

THOMAS T. REID.

THE ALBANY, N. Y.-PITTSFIELD, MASS., ROUTE.

Editor THE AUTOMOBILE:

[335].—The wide publicity given to the route selected for the forthcoming Second Annual Economy Test of the New York Motor Club suggests that something ought to be said to prevent this line being considered by prospective tourists the usual route between these cities. This is far from being the case, for, whereas the shortest and best line of road between Albany and Pittsfield is only 89 miles, the route laid out for this test is 76½ miles, or considerably more than twice as far.

This course was laid out to secure a larger mileage than the direct route would have provided. It was for this reason that the line was carried down from Schodack Center to Valatie and through North Chatham, Canaan Center, State Line, West Stockbridge, Glendale, and Housatonic to Great Barrington, where the course of the tour is almost exactly reversed and carried by the well-known line from Great Barrington to Pittsfield. At Pittsfield it is again directly reversed to Lenox, where the turn eastward is made for Springfield.

Referring to the map published in your issue of May 24, if one should connect Schodack Center and Pittsfield by a nearly direct line and imagine near the Interstate line (as shown) the Tatic Mountains, this would approximate the shorter and better route between these two cities for all practicable purposes. And it could then be seen at a glance where the more-than-double distances comes in. In fact from the standpoint of good roads, the detour southward from Schodack Center to Valatie is not advisable for the average tourist, though for this special purpose it may be all right.

To take another view of how far this is from the shorter and better Albany-Pittsfield route it is only necessary to add that Great Barrington, the most southerly point on the line as given in the official map, is on the direct automobile routes between Pittsfield and Poughkeepsie. Reference to pages 114, 115 and 116 of "The Automobile Official A. A. A. Blue Book" will show the route in detail from Albany to Schodack Center, where turn is made for Nassau, Malden Bridge and the Lebanons, thence by State Highway across the Tatic Mountains to Pittsfield.

The direct route already referred to has one other curious feature, it being 12 miles shorter than the mileage of the Boston and Albany Railroad between the same points. In order to get an easy grade over the Taticons, the railroad engineers of a generation ago took a very circuitous route, whereas the magnificent new State Highway west from Pittsfield gives the most perfect surface all the way across the interstate line. So good is this road that notwithstanding the grades it is an easy stretch to cover, and no one seems to have ever heard of an automobile being stalled upon it—except for shortage of gasoline.

Clinton, Onelda Co., N. Y.

ROBERT BRUCE.

THE BLERIOT AEROPLANE.

On the lake at Enghien, near Paris, experiments are now being made of the new aeroplane invented by Bleriot and Voisin. Bleriot is the well-known manufacturer of automobile lamps bearing his name. The aeroplane which he has brought forth in conjunction with M. Voisin has two pairs of superposed aeroplanes, which are connected one in front of the other, as in M. Archdeacon's machine, a proposition which did not prove entirely satisfactory. An eight-cylinder, 24-horsepower Antoinette motor supplies the propulsive power, and the engine is swung between the two planes.

The Bleriot machine has the ends of the aeroplane bent round to meet one another, so that the lifting surfaces really form a species of loop, an arrangement which obviously reduces the lifting power of the lower surfaces. The aeroplanes are mounted on floats of hollow tubular construction, the object of the whole arrangement evidently being to put up speed on the water sufficient to enable the machine to rise in the air, while the floats will keep it from sinking when it comes down again, provided only it comes down feet foremost, which, from the look of things, is by no means a foregone conclusion, according to the *Automotor Journal*. The aeronaut is supposed to lie horizontally on a plank in front of the motor.

The total span of the machine is six meters, the aeroplanes having a width of 1 1/2 meters, and the total surface being 60 square meters. The engine is rated at 600 revolutions per minute. M. Bleriot is counting upon taking part in the aeronautical prize competitions scheduled for the coming fall.

A DARRACQ-SERPOLLET COMBINATION.

A cable from Paris tells of a combination involving M. Darracq and M. Serpollet and the formation of a company with a capital of 12,500,000 francs for the construction of commercial vehicles, which will be both of the gasoline and steam types. The new Darracq-Serpollet factory will be built at Suresnes.

THE NEWS FROM CHICAGO.

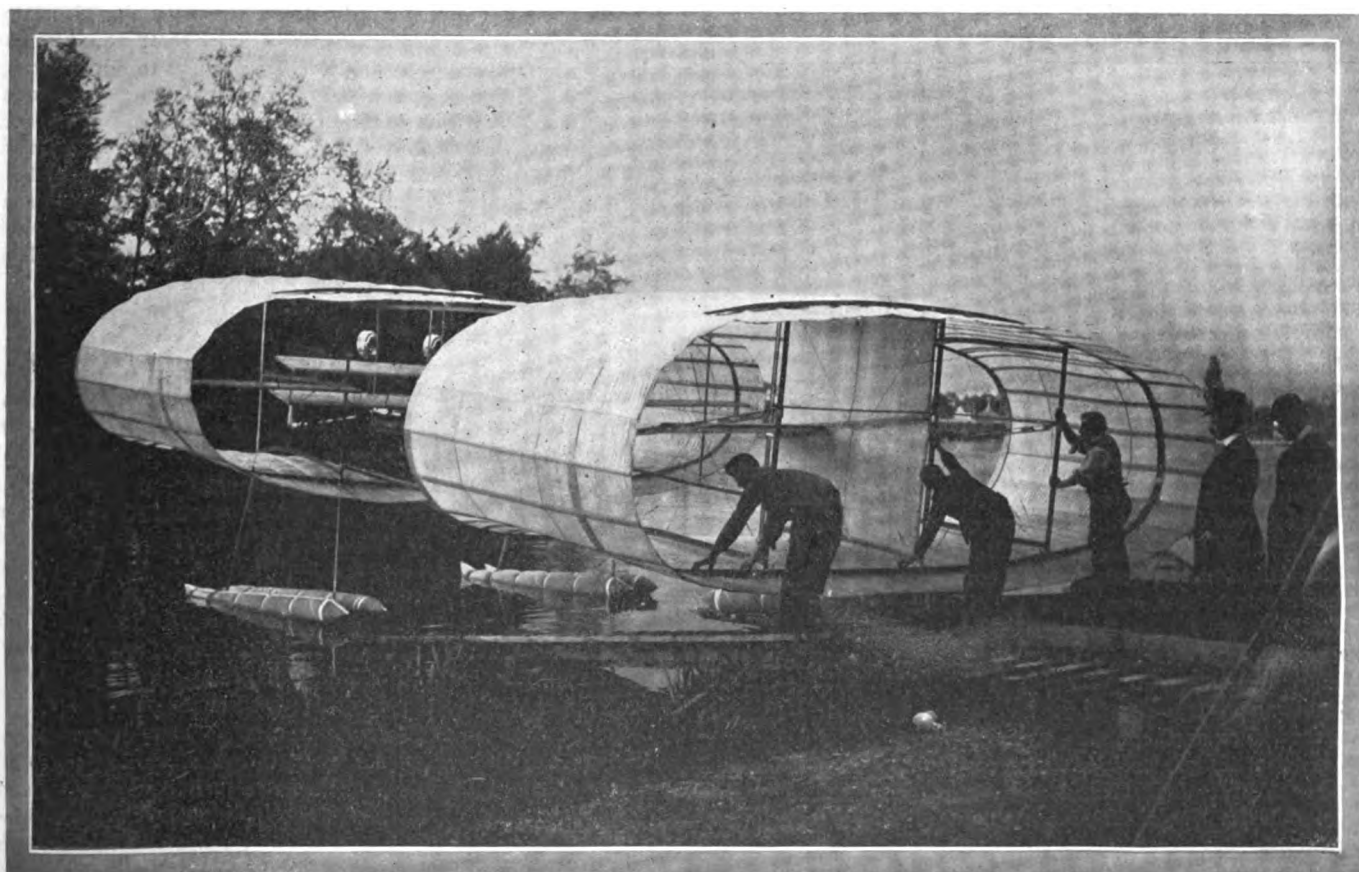
CHICAGO, June 3.—The Chicago Automobile Club is making plans for a 200-mile road race, to be run off in September, something on the order of the Vanderbilt Cup and other big road races. A triangular course of twenty-five miles has been proposed, and no difficulty is anticipated in getting authority to use the roads for one day. The road will be Westrumited to prevent flying dust, and ample police protection will be provided. The prize will be the Farson cup, given by President Farson of the Chicago Automobile Club.

A new automobile plan will be tried by Evanston, the suburb heretofore the bane of enthusiasts. Criminal proceedings will be discarded against scorchers for the civil suit, and alleged violators of the law will no longer be dragged into court. Thursday Chief of Police Frost ordered his men to refrain from putting every chauffeur under arrest who seemed to be running his machine faster than the village permits. Hereafter the driver will be warned of the fact that he is exceeding the speed limit and the policeman will take the number of his machine. This will do away with the stigma of being arrested on the highway. If the law is violated again after he has been warned, civil prosecution will ensue. Chief Frost desires to have an ordinance drawn up which will embody his ideas, and they will probably be put into form shortly by Corporation Counsel Hartman.

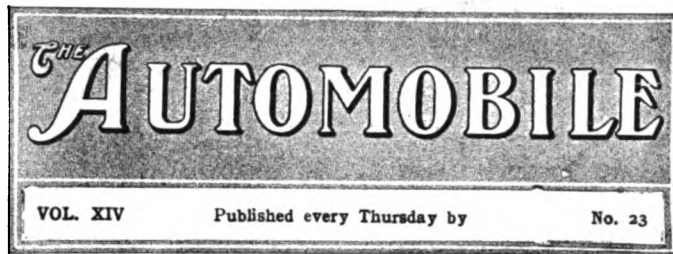
All of the arrangements for the annual run of the Austin Automobile Club have been completed and about 100 owners of cars have signified their intention of joining in the event. A trumpeter has been engaged from Fort Sheridan. A repair car will accompany the machines.

Barney Oldfield's manager has secured a permit for holding a race meet at the Harlem track, July 3 and 4. The track is in very bad condition at present, as horses are being worked out on it daily, but it can be brought into shape in a short time and will be in record condition by the day of the meet.

Chicago will have an innovation next month when three motor lifeboats are to be placed in the South park lagoons.



THE BLERIOT AEROPLANE AT LAKE ENGHIEEN BEING PREPARED FOR A FLIGHT.



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The Need for Constant Inspection.

For purposes of this discussion, automobilists who drive their own cars may be divided into two classes, those who take an interest in the mechanical side of automobiling and those who do not. Both classes contain men who drive their cars and those who employ a chauffeur for this purpose, though, of course, in numbers the former are largely in the majority. Those who do not take any interest in the automobile as a machine may have a lively appreciation of the advantages of mechanical propulsion, but this is entirely subordinate to an interest in what the machine enables them to do in the way of comfortable travel independent of public conveyances. As a general rule, however, it will be found that the owner who interests himself in the construction of his car and the functions of its mechanism will get a good deal more real enjoyment out of the use of the car. His trips and tours will be made without apprehension of any serious trouble which might have been avoided by a little preparatory work or even inspection, and, should any trouble occur he will be able to make an intelligent investigation and decide upon a correct remedy. Many a bill for hauling home or for unnecessary repairs or replacements could be avoided were the owner possessed of an understanding of the mechanism of his car, and only a very moderate amount of skill in making adjustments.

Beginning to-day, we should say, make a point of inspecting your car before starting out on a run of any length. See that fuel and oil supplies are sufficient, that the ignition connections are properly secured, and, where batteries are carried, that they are not run down. The roadside is not the place to make repairs or adjustments that could have been made in the garage. Give attention especially to the control gear, the spark and throttle connections, to see that they are not fouled or ready to fall apart, and,

above all, examine the steering gear and brakes. Coatings of mud frequently cover the connections, and something more than a casual glance is needed to make sure that the split pins are in place and the ends spread apart. Whatever functional derangement may occur in an automobile in motion, the prime requisite for safety is that it shall steer, and that the brakes will stop the car. Steer first, last, and all the time, no matter whether gears strip or shafts break, until the necessity for steering is ended by the car coming to a stop.

Lots of men will spend hours over ignition and carbureter adjustments to minutes or even seconds spent on examining the steering gear or brakes on which, perhaps, their own life depends.

On a long tour an inspection should be made at the meal stops. No matter how good the machine nor how excellent the garage service, nuts will work loose, and connections also. A single nut dropped off on the road (especially in a foreign car with metric threads) may mean the temporary abandonment of the car by the roadside.

Get the inspection habit, and it will not be long before its benefits will be felt in added hours of pleasurable driving.



Once More the Gordon Bennett Cup.

The conference which, at the request of the A. C. G. B. I., will take place on the eve of the Grand Prix at the course headquarters of the Automobile Club of France, will be a vital international session for automobile competition. Time was when France could claim a preponderance of capital interested in the industry, but there are other countries now equally important or so close to it that they belong in the same class. Since it is the life of automobile racing to have the maker interested, and of necessity there must be a pronounced streak of commercialism in this form of competition, there should be some consideration of the relative industrial importance of the countries engaged in international contests.

That small countries like Switzerland and Belgium should not be entitled to three cars in the Gordon Bennett, seems perfectly fair, and inasmuch the United States, Great Britain, Germany, and Italy will agree with the attitude of France. It would appear a logical and proper proceeding for the delegates to agree among themselves upon an equitable basis of representation; some countries to be considered in the first class, perhaps others in the second class, with the small countries given a single car. The Grand Prix is a limited international contest, and that there should be a return to the Gordon Bennett race with revised and modified conditions, is an opinion shared in by the leading countries interested in the industry. May the conference at Pont de Genes result in the resumption of the International Automobile Derby.



The Necessity of an Undivided Front.

If the present plan of conducting the American Automobile Association does not meet with the approval of a club belonging to it, it would seem to be the first move of that club to endeavor bringing about such essential changes of government that it might consider necessary. Differences of opinion are bound to exist in every organization, but its constituent parts must settle differences among themselves and present a united front to the opposition. The New York State Automobile Association faithfully served the interests of automobiling during the session of the New York Legislature, and every automobilist in New York State could well afford to contribute a dollar and much more in return for what it accomplished in preventing unjust legislation.

The American Automobile Association is not disintegrating, and if its machinery now and in the future does not run with required speed its directors can exercise their prerogatives and make any necessary alterations. There is great need, and will be for years to come, for a strong national organization, divided into state bodies, in order to conserve the rights of automobilists and work generally for the good of all concerned.

THE A. A. A. ANNUAL TOUR.

After various conferences and consultations of Chairman Paul N. Deming with members of the Touring Committee, it has been decided to have two divisions in the annual A. A. A. tour, one being those who participate for pleasure only and the other for those who contest for the Glidden trophy. The pleasure division will be open to all, but the contest for the trophy will be limited to touring cars with tonneau and seating at least four persons. The main tour will begin at Chicago and conclude at Bretton Woods in the White mountains. From Chicago the route is via South Bend, Toledo, Cleveland, and Erie to Buffalo. Then the contest for the Glidden trophy will begin, with the following schedule operative:

Dates.	Days Runs.	Miles.
Thursday, July 12..	Buffalo to Rochester	75½
Friday, July 13..	Rochester to Syracuse	97
Saturday, July 14..	Syracuse to Saratoga.....	154
Sunday, July 15..	Saratoga	
Monday, July 16..	Saratoga to Elizabethtown, N. Y....	100
Tuesday, July 17..	Elizabetht'n to Lake Champlain Hotel	35
Wednesday, July 18..	Lake Champlain to Hotel Montreal..	85
Thursday, July 19..	Montreal	
Friday, July 20..	Montreal to Three Rivers	94
Saturday, July 21..	Three Rivers to Quebec	81
Sunday, July 22..	Quebec	
Monday, July 23..	Quebec to Jackman, Me.....	112½
Tuesday, July 24..	Jackman to Rangeley Lakes.....	80
Wednesday, July 25..	Rangeley	
Thursday, July 26..	Rangeley Lakes to Bretton Woods....	115
Total mileage		1,029

By declaring on the entry blank their intentions entrants will become contestants for the Glidden trophy. Entrants for the pleasure division will be permitted to join at Saratoga or any point west of that city, and they will be subject only to rules governing their registration in and out of official garages and such other general regulations as may be deemed necessary by the Touring Committee. Contestants for the Glidden trophy will be subject to rules and regulations which will be announced this week.

The system of scoring is to be on a time basis. A schedule based on the maximum legal speed between town and town (with allowances for luncheon, legal speed and traffic conditions, restrictions, etc.) will be prepared by the committee for each day's run. Each driver on checking out in the morning will be notified of the exact hour and minute when he must reach the following garage control. He will be penalized one point for each minute beyond this set time. Should he arrive before the hour and minute set, he will be penalized two points for each minute in advance of the time allowed. In addition repairs or adjustments on cars in garage will be allowed only on written application and a contestant will be penalized one point per man employed per minute. On arrival at garage controls and reporting in, the cars will be locked up for the night and visited by their drivers or others only under above conditions. At the close of the tour the lowest score will win.

The entries, at \$50 each, will close at 12 o'clock noon on Tuesday, July 3, with A. B. Tucker, 31 West Forty-second street, New York City. The numbers will be awarded in order of receipt of entry. N. H. Van Sicklen, Frank B. Stearns and Charles J. Glidden are the first of the entries received.

JUNE MEETING OF A. A. A. DIRECTORS.

It developed at the regular monthly meeting of the A. A. A. Board of Directors that the Long Island Automobile Club will remain a member of the National and State organizations, at least until October 1. Though the plan of collecting club dues in New York state is through the State Association, the Long Island club this time sent its money direct to the National secretary. The receipt of the dues resulted in the tabling of the resignation letter which followed the June 1 meeting of the Long Islanders, when, by a vote of 19 to 6, they decided to sever relations with the A. A. A. Apparently, despite this action, there is

a strong disinclination on the part of many club members to have the club "paddle its own canoe." The comparatively meager attendance of only two score out of over 300 members may not have represented the majority sentiment of the club, and in consequence some of its principal officers have taken it upon themselves to keep the club in good standing until October next.

It is understood that a new Brooklyn club will be formed to take the place of the Long Island club in the A. A. A. if action is requested on the tabled resignation at the October meeting. Inability to enter the annual A. A. A. tour, no connection with the Vanderbilt Cup race, and the suspension of all A. A. A. reductions in tour books, etc., is said to have caused a change of sentiment by some of the club leaders.

As usual, the A. A. A. directors met at the clubrooms of the Automobile Club of America, 753 Fifth avenue, Vice-President L. R. Speare being in the chair in the enforced absence of President Farson. The resignation of Asa Goddard, who has removed to Cleveland, as the director of the Worcester Automobile Club, was accepted, and J. P. Coghlin, the president of that club, was elected to the vacancy. The individual membership is increasing at a rapid rate, and the affairs of the association are generally prosperous. Directors Morris, Post, White, Pardington, Farrington, Batchelder and Secretary Gorham were present at the meeting.

EUROPEAN CIRCUIT TO BE POSTPONED.

PARIS, May 19.—A meeting of the Commission des Concours, the body charged with the organization of the European Circuit, was held at the Automobile Club of France last night, when the proposition of Germany to postpone the tour until 1907 was discussed. There was a feeling in favor of postponement, but as the committee has no power to make a change of date the matter was referred to the International Executive Committee, consisting of delegates from Austria, Belgium, France, Germany and Italy, together with the Marquis de Dion as president and M. du Bousquet as secretary. There will be a little delay before the final decision is known, owing to the delegates being scattered over Europe, but there is little probability of the event being run this summer.

JERICHO TURNPIKE WILL BE WIDE ENOUGH

A trolley track has been constructed along the Jericho road from Queens to Mineola, where it will connect with the Hempstead trolley road just beyond the point of the location of the grandstand of last year. This track is placed to the right of the road. Whether it will interfere with the Vanderbilt race in any way is a question; but probably not, as the Jericho road is very wide, and there is still ample room left for cars two or three abreast in the hardest kind of a race. The track will not rise above the surface of the roadway and may be traveled over at speed. Chairman De Mont Thompson said some days ago that he did not consider this trolley road any drawback to the use of the Jericho turnpike. There is one bad feature to it, and that is the narrowing of the swing from Hyde Park road into the Jericho road, as no driver would care to make this at high speed.

GUADALOUPE NEEDS AN AUTO 'BUS LINE.

Consul G. Jarvis Bowens, of Guadeloupe, writes that there is an opportunity just now for an enterprising American to run a daily passenger line of automobiles from that place to Basse-Terre, a distance of about forty miles. The government of that West India island will grant a subsidy of \$6,000 annually for the assurance that the mail will be taken twice daily, and will require a deposit of \$1,500 to insure faithfulness of contract, which can run for twenty years. With the present facilities, travel between these towns is quite a problem. It takes six hours or more by boat or diligence, neither of which runs daily, and it is said that a daily motor line would pay. It would require about six machines, one each of 10, 8, 6, 4, and 2 seats and about the same number of chauffeurs until local men could learn to handle the machines.

AN AIR-COOLED 500-MILE NON-STOP RUN.

A remarkable run of 500 miles in an air-cooled car without stopping the engine was finished on the evening of May 30, when a Knox four-cylinder 40-horsepower touring car came to a stop at the works of the Knox Automobile Company, Springfield, Mass. With seven passengers, averaging 150 pounds weight, and 300 pounds of baggage and supplies, the car weighed about 4,300 pounds. Starting from the Hotel Worthy, Springfield, at exactly 12 o'clock, midnight, Tuesday, May 29, the car was driven through Hartford, New Haven and Bridgeport to New York, arriving at Central Bridge, One Hundred and Fifty-fifth street, New York, at 5:45 in the morning. The car was inspected without stopping the engine, and the same route followed back to Springfield and on through Palmer and Worcester to Boston, arriving at the Hub at 4:18 P. M. The car was started back for Springfield after a few minutes, and the home town reached at 7:53 Tuesday evening, making the total time for the trip 19 hours 53 minutes, including stops. The running card was signed at each town the car passed through; but no stops were made for meals, provisions being carried in the car. The members of the party were pretty thoroughly used up at the end of the trip and were unfeignedly glad it was over. The trip was uneventful, not even a puncture having disturbed the smooth course of events. At Meriden, Conn., a railroad crossing tender neglected to lower the gates on the approach of a train, and the car nearly ran into the engine, being stopped within a few yards of the track.

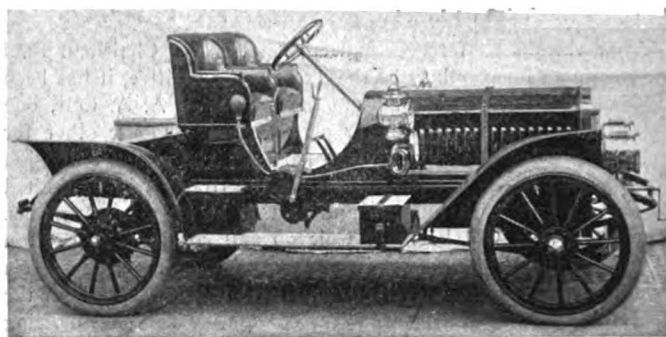
The car was driven by William E. Wright, vice-president and general manager of the Knox Automobile Company; the machine was a regular stock car, taken from the factory after the usual final test had been satisfactorily passed.

A BOOKLET THAT FILLS THE BILL.

The automobile manufacturer is fast learning that the highest class of advertising does not consist of standing on the corner and shouting, "I am the best and only!" but of instilling into the public mind what the automobile really is from a mechanical point of view, how it is made and how it should be taken care of—in other words, educating the public up to the automobile, just as it has been educated up to the horse. A striking example of educative advertising is found in the booklet recently issued by the Olds Motor Works, of Lansing, Mich., under the title, "A Busy Man's Text-book of Automobiles." Beginning by explaining the operation of the four-cycle motor, the book carries the reader to each part of the modern automobile, explaining its construction and functions and illustrating every step with half-tones and line engravings. The illustrations are made from the parts of Oldsmobile cars, but this fact is not brought forward; in fact, the word "Oldsmobile" does not appear in the title page or in the text until the last few pages are reached, where descriptions of the Lansing factory and the Oldsmobile cars occupy a small part of the book. The descriptions consist of plain, unvarnished statements of facts, without comment or expression of opinion. The book contains forty-eight pages and the press work is of the highest class. Altogether it is a credit to all concerned in its production.

MEMORIAL DAY MEET AT INDIANAPOLIS

INDIANAPOLIS, IND., June 4.—Memorial Day was observed in the Hoosier capital by the fifth annual race meet of the Indianapolis Motor Association on the Indiana Fair Grounds track. Barney Oldfield, W. T. Muir and Paul Kaiser were among those on the program in addition to a number of the best local drivers. C. A. Coey, of Chicago, was unable to appear in the Hoosier sweepstakes, on account of the failure of his car to arrive. Oldfield, with the Peerless *Green Dragon*, reeled off an exhibition mile in :58 3-5, breaking the local record. He also won the 50-mile endurance Derby in a 24-horsepower Peerless in 1:09:08 4-5. In the 3-mile novelty race, Harry Stutts, a local driver, in 28-horsepower Oldsmobile, defeated Oldfield.



FRAYER-MILLER 6-CYLINDER HIGH-POWERED RUNABOUT

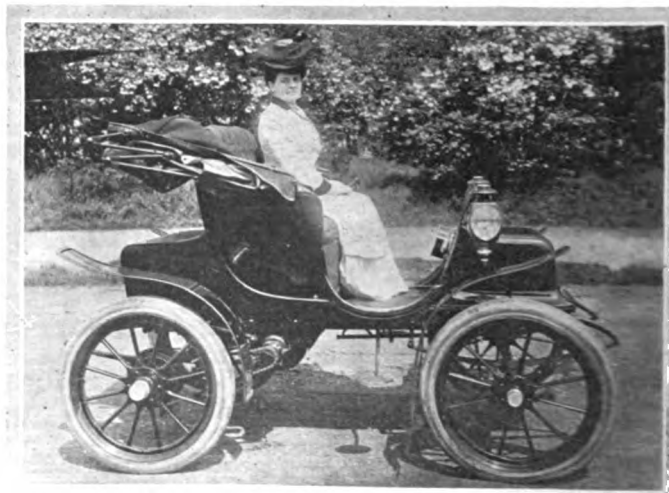
CANADIANS CELEBRATE AT VICTORIA, B. C.

VICTORIA, B. C., May 26.—While the rest of the Puget Sound district was experiencing a deluge, automobile events were run off here yesterday and to-day in connection with the annual three-days' celebration of Victoria Day. The automobile parade of Friday proved one of the most interesting features of the celebration; the cars were gayly decorated. Dr. Ford Verrinder's Cadillac took first prize for touring cars, second prize going to Captain J. W. Troup's White steamer. A. St. Clair won first prize for runabouts.

The automobile races were held at the half-mile trotting track. Three Cadillacs were entered in the first event, a one-mile race for runabouts; Dr. Verrinder won in 2:21 1-5, with L. Fisher second and George Miller third. The best race of the afternoon was a three-mile event between a Frayer-Miller driven by Mr. Caldwell, a Thomas driven by Virgil Hall and a Winton driven by E. Ferris. The Winton won in 3:55 4-5, with the Thomas a very close second. The two-mile race for touring cars of less than 20 horsepower was won by Dr. Verrinder's Cadillac in 4:34 4-5. A pursuit race brought the Winton, Thomas and Frayer-Miller together again. The Winton caught the Thomas in the seventh lap, the Thomas having been distanced early in the race. The Thomas had its revenge in a match race with the Frayer-Miller, however, and won an exciting contest of three miles in 5:49 1-5. Trials against time concluded the day's events, the best time for one mile being 1:46 1-5, made by the Winton.

PREFERS AN ELECTRIC FOR SOCIAL CALLS.

Although Mrs. Harry S. Houpt is an expert operator of a Thomas Flyer, she finds it more convenient to use her Rauch & Lang electric stanhope for shopping and social calls, on account of its size and simplicity of operation. The makers of this vehicle guarantee seventy-five miles on one charge of the battery. Mrs. Houpt will use the stanhope this summer at Deal, N. J., where Mr. Houpt has just completed his new summer residence.



MRS. H. S. HOUP IN HER RAUCH & LANG ELECTRIC RUNABOUT

NEW A. M. C. M. A. MANAGER.

The American Motor Car Manufacturers' Association has established headquarters at 29 West Forty-second street in New York City, and Alfred Reeves now figures as the general manager of the association. This important move was decided upon at the May 30 meeting of the Executive Committee, which continued its session into Thursday. A branch of the association will be



ALFRED REEVES.

provided for the importers who prefer to remain aloof from those who recognize the Selden patent. The committee placed itself on record as being opposed to any weight limit in connection with the contest for the Glidden trophy, the principal prize of the annual A. A. A. tour. It was considered that the tour of the A. A. A. and other similar events were of benefit to automobilism in general and would have the support of the association.

The selection of Alfred Reeves as the general manager is considered an excellent move on the part of the A. M. C. M. A., for

the ability of Mr. Reeves is generally recognized in automobilism. He has been identified with the progress of events ever since the inception of the industry, is a born hustler, and withal has a reputation for square dealing and integrity which any man might consider a valuable asset. Under the able direction of the new manager it would appear to be an assured thing that the affairs of the organization will flourish in a substantial manner. If any man knows how to secure newspaper publicity Reeves is that man.

Those in attendance at the meeting include: James Couzens, chairman Ford Motor Company; Benjamin Briscoe, Maxwell-Briscoe Company; W. C. Marmon, Nurdyke & Marmon Company; W. H. Vandervoort, Moline Automobile Company; Charles E. Duryea, Duryea Power Company; Charles Lewis and J. Matthews, Jackson Automobile Company; and William Mitchell Lewis, of the Mitchell Motor Car Company.

DUQUESNE TO REMOVE TO ERIE, PA.

BUFFALO, June 4.—Information is at hand of a big business deal pending, whereby the Duquesne Motor Car Company, which has a big factory at East Jamestown, N. Y., will move to Erie, Pa., where the industry will be reorganized on a bigger scale with a capital of \$300,000. M. Liebel, Jr., and Edward Heuer, both of Erie, are backers of the deal. A member of the firm said yesterday that the deal would have been closed already had it not been for the recent mysterious disappearance of M. Liebel, Sr.

The property in Erie to be occupied is at Sixteenth and Parade streets. The factory has been employing seventy men. It was started in Jamestown a year and a half ago. One of the leading organizers of the company was LeRoy Pelletier, well known in Buffalo and a member of the Automobile Club of Buffalo. Mr. Pelletier is now associated with the Ford Motor Company in Detroit. The general manager of the Duquesne Motor Car Company is John H. Wright. The deal to take the business to Erie is being made because the Jamestown stockholders did not want to advance the necessary money to run the business on the proposed big scale.

M. Liebel, Sr., left his home in Erie a week ago yesterday morning, saying he was going to Buffalo on business and would return the same evening. He has not been heard from since.

"The pious monks of St. Bernard" have purchased a 10-horsepower automobile to carry supplies to their monastery on the mountain of that name in the Alps.

BUICK TESTERS ORGANIZE.

JACKSON, MICH., June 4.—The testers of automobiles employed by the Buick company have organized a society for mutual benefit. The organization is entitled the Buick Testers' Association. The primary object is the payment of damages in case of collisions. At present in such cases the company holds the tester liable. The association provides that the tester pay one-third and the association two-thirds. Speed limits are not to be exceeded, and in case a member violates the law a fine is imposed. Aside from the benefits there are educational features, the members engaging in the study of gasoline engines.

The officers of the association are: President, John Trumble; vice-president, Glen Breed; secretary and treasurer, Leo E. Emmons.

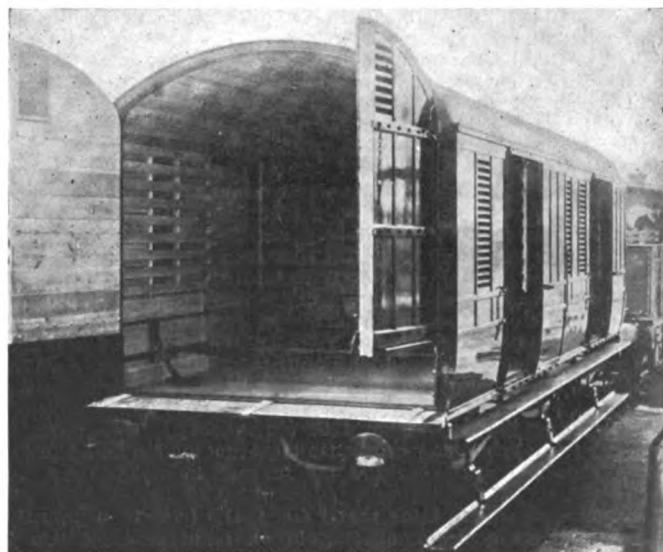
There are no fees or dues, necessary funds being raised by assessment. Members are both active and honorary, the latter being members of the company and members of the office force.

DARRACQ'S NEW NEW YORK HOME.

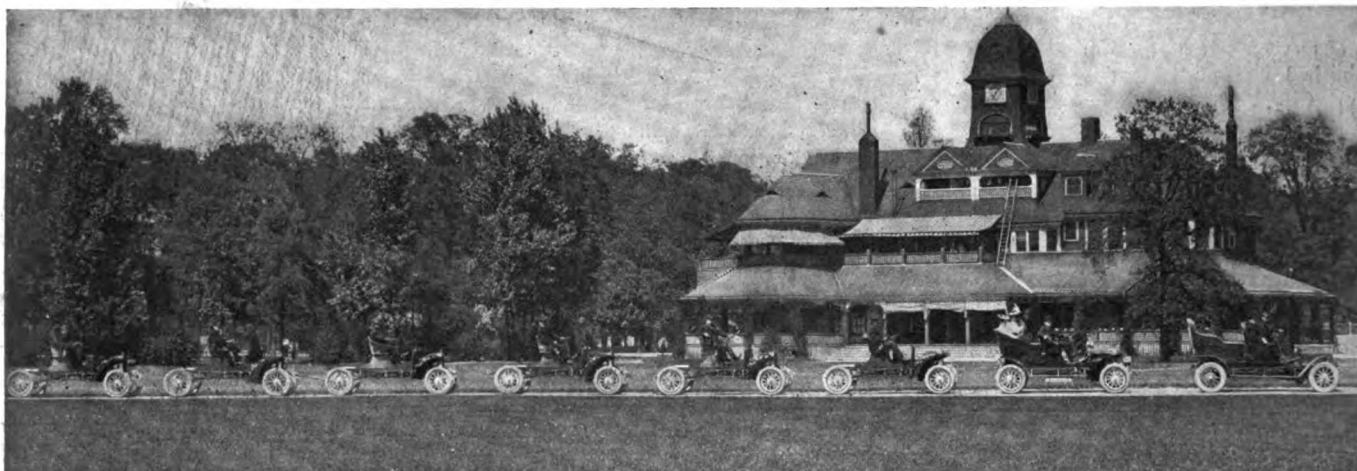
The last of the big New York City automobile concerns who have had their salesrooms downtown have moved to "Automobile Row" uptown. They are the representatives of the Darracq car, now organized under a new company known as the Darracq Motor Car Company. For its home uptown the Darracq people have selected a new building specially built for them at 1989 Broadway, between Sixty-seventh and Sixty-eighth streets. It is not quite completed, but the company is moving in and the salesroom will be ready in a few days. G. M. MacWilliam, who has been general manager of the Darracq interests in this country, will be president and general manager of the new Darracq Motor Car Company. Louis R. Caswell, formerly with the Viqueot Company, has joined the selling staff of the Darracq company.

BOSTON TRADE BODY'S NEW OFFICERS.

BOSTON, June 4.—The Boston Automobile Dealers' Association, hereafter to be known as the Boston Automobile Dealers' Association (Incorporated), has reorganized and adopted new by-laws. The old organization, after voting to permit the new association to use its name, dissolved. The officers of the new association are last year's show committee and manager, as follows: President, J. H. MacAlman; vice-president, George H. Lowe; treasurer, E. A. Gilmore; secretary, C. I. Campbell. The executive committee consists of the above-named and Arthur Hinchcliffe, A. E. Morrison, J. W. Maguire, Harry Fosdick, and Charles E. Fay.



AUTOMOBILE CAR ON MIDLAND RAILWAY, ENGLAND.



SEVEN NORTHERN FOUR-CYLINDER CARS THAT WERE HAULED AT A TEN-MILE SPEED WITH NORTHERN AIR CLUTCH.

SUGGESTIONS THAT ARE TIMELY.

From C. W. Kelsey come some excellent suggestions concerning racing rules for stock car events. Mr. Kelsey directs his communication to the Racing Board through Secretary S. S. Gorham. Herewith is the letter in full:

To the Racing Board of the American Automobile Association.

Gentlemen:—I should like very much to see automobilism as a sport put on a very much higher basis than it is at the present time, and to this effect I would make the following suggestions, which I think will have a great tendency towards elevating and improving automobile contests.

In the first place, I think that the A. A. A. should make a rule something to this order: Any manufacturer entering a car in any event sanctioned by the A. A. A. and making his entries in a stock class, and deliberately putting in a car which is not stock, should be debarred from entering in any event which the A. A. A. sanctions for the period of one year.

A rule of this kind, of course, would be very important, and it might be well that, when such a protest is filed, it be referred to a special committee of the A. A. A., into whose hands the car protested against be placed, and they make a thorough examination of such car to ascertain whether the car is stock throughout.

I have taken this matter up with several manufacturers and every one of them is of the same opinion. We all feel that as long as there is any partiality shown, or that there is any chance for crooked work, the automobile game cannot be elevated to clean sport.

Another matter which I think should also be taken up is, that when an entry form is gotten up for any event which specifies classes of cars, the referee for such an event should be more careful in seeing that only cars which are eligible are entered.

At the present time, the general tendency is to allow any car to enter any event so long as some one does not put in a protest. This, of course, is very wrong. First of all, a man enters a certain event only after he has made up his mind what other cars are eligible. After he has found out that he has a reasonable show, he sends in his entry fee. Now, when he finds cars entered in his event which are not eligible, he naturally is dissatisfied, for he feels that he has paid his entry fee for something which he is not getting; in other words, the promoters of the event get his money under false pretences. He also hesitates about protesting, owing to the feeling which a protest generally makes.

Now, it is absolutely wrong to get entries under these conditions. At the present time, every manufacturer believes that every other manufacturer is putting special cars in these tests, and, in a great many instances, this is undoubtedly true. The public in such instances is being greatly deceived, and there is no real value derived from any such contest.

Now, what is needed is some rules on the above order which shall be very rigidly enforced, and until some such rules are made, automobile races and endurance contests will be nothing more than a farce.

Automobilism and sport should be synonymous. Unfortunately, however, there is nothing sportsmanlike about present automobile contests, owing entirely to the lax manner in which they are carried out.

I do not wish you to think that I feel that I have been unjustly treated. On the contrary, all the officials in every event that I have been entered in have been most courteous and obliging, and everything has been done that I have ever requested, but I feel

that some rigid rules should be taken immediately to have something of this kind done. Horse racing is called "the sport of kings." Is it not time that automobile racing should be termed "the sport of gentlemen"?

C. W. KELSEY,
Maxwell-Briscoe Motor Co.

SEVERE TEST FOR NEW AIR CLUTCH.

To prove the effectiveness of its new air clutch, the Northern Manufacturing Company, of Detroit, has been conducting a series of experiments. A recent test was made in hauling seven Northern four-cylinder cars on an average speed of ten miles per hour. The ordinary working pressure for the air clutch is 60 pounds, but in this particular instance the pressure was reduced to 18 pounds gauge pressure to see what could be done, and there was absolutely no slippage reported.

The first test car has been driven 10,000 miles, and the factory experts say that no wear can be detected on the clutch surfaces. A feature embodied in the clutch is its self-adjusting properties, which, it is stated, is something absolutely new in automobile clutches, and will be readily appreciated by the man who drives. A further test was made by disconnecting the air-pump connection and attaching a rubber tube so that the operator could blow into it, thus putting a slight pressure on the clutch by lung power. This pressure was found sufficient to drive the car. In putting this clutch on the market, the Northern Manufacturing Company states that it is convinced that it has eliminated some of the accepted clutch difficulties, and produced an article that will outlast those of the cone or expanding type.

ABROAD THERE ARE VARIED EVENTS.

Competitions for automobile parts and accessories are deservedly popular abroad, and are doing a great deal toward bringing the automobile to perfection. Competitions for nearly every part and accessory have been held, and one of the latest was the speed-indicating and registering instrument competition for a prize offered by Henry de Rothschild; the event took place over a 100 kilometer road near Paris on Friday, May 11. The conditions specified that the apparatus must be placed on the dashboard in plain sight of the driver of the car. An observer was sent with each car to watch the behavior of the instrument. While the prize winner was not decided upon until May 29, the instrument illustrated herewith and called an "odotachymeter" is understood to have ranked high. The speed is indicated on the dial on the top of the case at the center, while the rate of travel, stops and so on are permanently recorded on the paper strip that is caused to travel from one roller to another when the car is in motion.

HENRY FORD ON THE SIX CYLINDER.

Henry Ford claims premiership among American designers for the appearance of the six-cylinder cars, he having entered a six-cylinder car in competition at Ormond in the winter of 1903-04. In the same year, however, a Napier six-cylinder car also competed, and, as a matter of fact in this regard our British cousins were a year or two ahead of us, for the six-cylinder touring car had gained headway in popularity. Until within the last few months it has been known in this country only in the speed class. In reply to the charge frequently made by those who still advocate the four as against the six-cylinder type, Mr. Ford gives out the following comparative data:

"The six-cylinder motor not only is not heavier than the four-cylinder one of the same power, but, on the contrary, has several pounds the better of its opponent in this regard. Without having authentic power tests at hand the only way to compare the powers which two motors are 'entitled' to develop is to compare the piston displacement of each. Compression and speed being equal, the difference between the two will be so slight it may be considered a negligible quantity.

The six-cylinder Ford motor is rated at 40 horsepower. The cylinder dimensions are 4 1-2 x 4 1-4 inches, bore and stroke respectively. The total piston displacement in the six cylinders is therefore 360.5 cubic inches; four cylinders having the same piston displacement would need to have a bore and stroke of 5 1-2 and 5 1-4 inches respectively. (Motors of these dimensions are ordinarily rated at 50 horsepower—they are over-rated or Fords under-rated—take your choice.) A four-cylinder motor of the above dimensions would ordinarily have a flywheel of 20 inches diameter and weighing not less than 140 pounds. The Ford six has a 16-inch flywheel weighing 65 pounds. By increasing the diameter to 20 inches, our flywheel need weigh only 50 pounds, or 37 pounds if the diameter was 24 inches, the usual size in single-cylinder motors. In short, the weight may be decreased to any desired amount by increasing the diameter. Road clearance being an object and having 'weight allowance to spare,' we use a small flywheel.

"If the four-cylinder maker wanted the same road clearance and so reduced his flywheel to the Ford diameter—16 inches—he would have to put 175 pounds of dead metal into it to get the same results as he gets with his 140-pound, 20-inch wheel. That the six-cylinder motor of same total piston displacement is lighter than the four of the same power is shown by the following: The two extra cylinders in the Ford K weigh, with valves, and all attachments, exactly 56 pounds. Two extra pistons and connecting rods complete, 17 pounds. The additional length of crankshaft and aluminum base of the six are exactly compensated for

by the necessarily larger diameter of those in the four with its large bore and longer stroke. We then have 73 pounds of extra weight due to the addition of the two cylinders, which is, however, offset by 75 pounds reduction in the flywheel weight necessary for this type of motor. Credit the six with 2 pounds.

"But the larger cylinders necessary to produce the same power in four that we get from six would weigh fully 25 per cent. more each than the smaller ones—they must not only be larger, but the walls, water jacket spaces, pistons, and other parts also must be larger. The six-cylinder motor of equal power then, is 25 to 30 pounds lighter than the four of same power. Any other basis of estimating the horsepower to which either motor was 'entitled' would give the same answer, as would the still simpler and more convincing test of weighing a Ford six-cylinder motor on the same scale with any four-cylinder one of the same capacity."

WHAT H. H. FRANKLIN SAYS ABOUT IT.

H. H. Franklin states that the six-cylinder car will have the call for 1907 for high-powered, high-priced cars. "This type of car is the car for the man who wants the most that money can buy and the best that mechanical genius can devise. The advantages of the six-cylinder motor over the four-cylinder, are well known. These advantages, however, are not such as to make the four-cylinder car any the less popular except in the class of cars mentioned above."

Mr. Franklin says that the gearless car now much discussed is an impractical proposition and is interesting only as a mechanical accomplishment. "It will never," he says, "have a commercial value. It offers no advantages over a car with two or more gear speeds and lacks many advantages these cars possess."

JERSEYMEN ARE SHOWN OILED ROADS.

The New Jersey Automobile and Motor Club will lay one mile of oiled road as an example for the authorities of New Jersey at once. To demonstrate to the Board of Freeholders of Essex County and also to the Board of Freeholders of Hudson County the value of oiling as a means of preserving the road and saving dust, members of the Newark and Jersey City clubs took a number of these officials to Long Island last Friday to inspect the various roads, including those of the Vanderbilt Cup course, which have been oiled on the island, and to study the different methods of doing the work and style of material used and its value. The trip covered about 100 miles, and pretty nearly every stretch of oiled road on the island was gone over and carefully inspected.



BOARD OF FREEHOLDERS OF HUDSON COUNTY, N. J., INSPECTING LONG ISLAND'S OILED ROADS

Patents

Two-Cycle Engine.

No. 820,497.—F. H. Hurlbut, of Alameda, and J. W. Munroe, of San Francisco, Cal.

An engine comprising two single-acting power cylinders, and a double-acting pumping cylinder between them; together with governor - controlled valve mechanism whereby the engine may be slowed or reversed by acting on the charges compressed by the pumping cylinder.

Spark Timing Device.

No. 819,283.—T. B. Jeffery, of Kenosha, Wis.

The spark timer is connected to the throttle in such a manner that the spark is advanced proportionately to the opening of the throttle, up to a certain point, beyond which the throttle opens without effect on the spark timer.

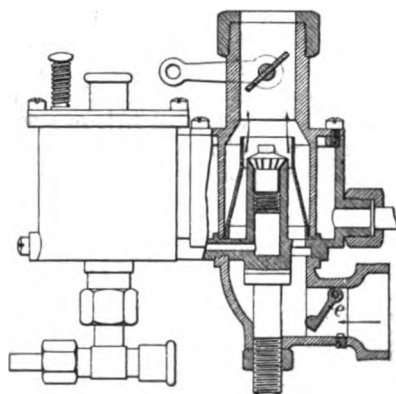
Storage Battery Jar.

No. 819,159.—R. M. Newbold, of Louisville, Ky.

A jar whose cover is fitted with soft rubber rings making water-tight joints between the cover and the sides of the jar, and between the cover and the terminal lugs of the plates.

Carbureter.

No. 820,583.—A. A. F. & G. Longuemare, of Paris, France.



LONGUEMARE CARBURETER.

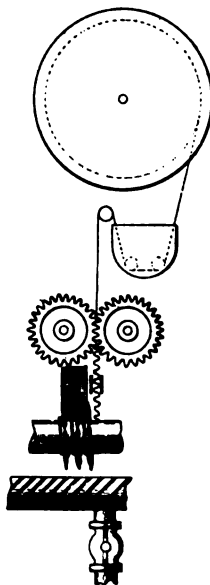
The Longuemare carbureter is made partially automatic by the addition of a flap valve *e* at its intake. The valve closes against a stop, and opens more or less according to the degree of suction.

Method of Making Radiator Tubes.

No. 817,938.—F. H. Stolp and C. Wright, of Chicago, Ill.

This is a process of applying crimped flanges to radiator tubes in the form of a continuous spiral, which is wound on the tube as the latter is revolved. The continuous flange is crimped as it comes from the

reel by passing through a pair of spur pinions as shown. As it winds edgewise on the tube, the crimps are partially straightened out on its outer edge. A continuous solder wire is run through a bath of flux and is



RADIATOR TUBE MACHINE.

wound on the tube between the spirals. A gas jet follows the winding at a distance of a few revolutions, and melts the solder, thus completing the process.

Motor Cycle.

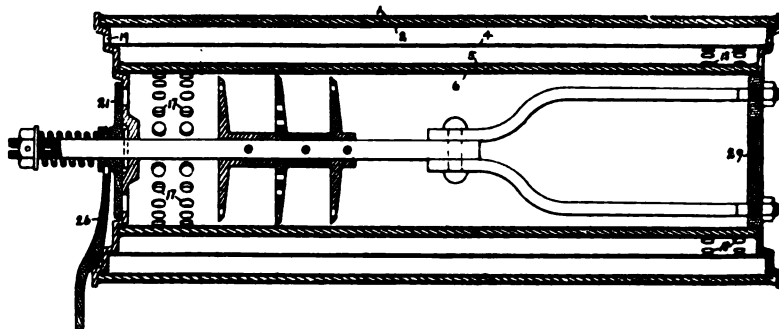
No. 818,609.—E. Bütikofer, of Biel, Switzerland.

The hub of the rear wheel is greatly enlarged so as to run on ball bearings around the crankcase of the engine, which has two horizontal opposed cylinders and is secured rigidly to the cycle frame. The crankshaft lies fore and aft and drives the rear wheel through a bevel pinion and gear.

Ball Bearing.

No. 819,656.—W. Hoepflinger and E. Sachs, of Schweinfurt, Germany.

An annular ball bearing in which the balls are kept out of contact with each other by a pair of notched spacing rings, one on each side. The balls fit in the notches, and the rings are connected by transverse pins riveted over.

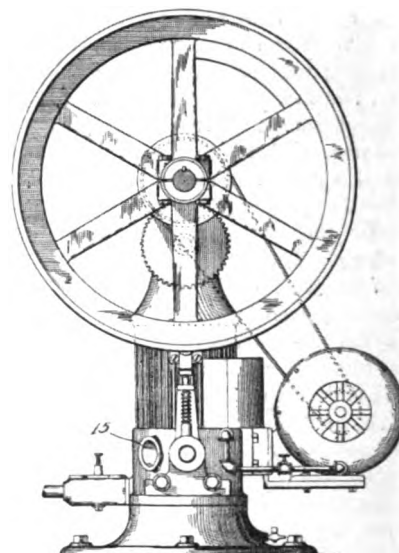


GRAY'S NON-RESONANT DOUBLE-SHELL MUFFLER.

Cylinder-Cooling Means.

No. 820,549.—E. P. Caldwell, of Chicago.

A centrifugal blower run by a belt or otherwise delivers air into a jacket surrounding the cylinder head. The cylinder wall has longitudinal ribs cast on it, and the air issues from the jacket through holes located between the ribs, so that it blows lengthwise of them before being discharged. In order to supply a large volume of air to the jacket around the head, a direct outlet 15 is provided, which seems quite unneces-



CALDWELL AIR-COOLED MOTOR.

sary, as the air escaping from it would do more good if discharged over the ribs, the holes being enlarged for that purpose.

Muffler.

No. 820,566.—E. P. Gray, of Detroit, Mich.

A muffler made non-resonant by having the shells 1 2 and 5 6 made double and separated by asbestos or the like. The exhaust gases enter at 29 and pass through the baffle plates and the holes 17 18, escaping finally from holes 19 at both ends of the muffler. A combination cut-out and relief valve is provided at the left-hand end by the disk valve 21, closed by a spring and opened either by internal pressure or by the lever 26.

NEWS AND TRADE MISCELLANY.

H. A. Lozier, of the Lozier Motor Company, sails June 7th on the *Baltic* for a two-months' European outing. He will tour in a 40-horsepower Lozier car, which has preceded him, and will witness the Grand Prix, June 26-27.

The 35-horsepower engine of *Old Betsey No. 1*, the Columbia car which three years ago created the original Chicago-New York road record, is still doing duty in the fast motor boat *Columbia*, on the Connecticut river.

H. N. Dunbar, formerly with the Franklin and Ford companies, has joined the selling force of the Aerocar Company of Detroit, and will act as traveling representative for Manager Percy Owen of the New York branch.

The Middleton Motor Car Company, Pacific Coast agents for Columbia cars, has opened a new garage in the unburned section of Van Ness avenue, San Francisco, and since the disaster have sold eleven high-powered Columbia cars.

Following out its usual policy of competing in economy and efficiency tests, the E. H. V. Company, manufacturers of Compound cars, will start one or more entries in the second economy test of the New York Motor Club, to be held June 20, 21, and 22.

Three new buildings will be added to the plant of the Western Motor Works, at Logansport, Ind., during the summer, which will increase the capacity of the plant fully 50 per cent. Steam power is to be done away with when the additions are completed and electricity substituted.

A heavy shipment of automobiles has just been made from the Rambler factory at Kenosha, Wis., to the Rambler branch at San Francisco. The shipment consisted of 50 surreys, Type 1; 10 of Type 3; 20 of Model 14; 6 of Model 15. The order calls for 86 machines aggregating in value \$123,500.

In the reliability contest recently held in England under the auspices of the Automobile Club of Great Britain and Ireland, the Jones speedometer scored the highest possible number of points in the severe test of 2,000 miles. A commission of fourteen judges awarded the prize, a handsome gold medal, and extra precautions were taken by the Automobile Club to insure an impartial verdict.

No vehicle appears to be too heavy to be benefited by the use of Hartford shock absorbers. During the past four months they have been in use on the big sight-seeing buses of the Manhattan Autocar Company in the metropolis with very excellent results. These buses when loaded weigh five tons each. The new Hartford garage at Broadway and Eighty-eighth street is now open and in first-class running order. President Hartford has arranged matters so that suspensions can be applied to a car while the chauffeur waits, the use of the car not being lost thereby for any length of time.

The Supreme Court of Vermont has sustained the contention of the Rutland Railroad Company in its claim that the State Board of Railroad Commissioners had no authority to issue an order prohibiting it from running its locomotives with the tender ahead. The order grew out of the fatal accident at Bennington, Vt., last November, in which Harris P. Linsley and Miss Evelyn P. Willing lost their lives while crossing the tracks of the Rutland

railroad, in an automobile. The opinion by the justice held that the commissioners had no authority to make the order in question, as the hearing at Bennington was held solely to determine the cause of the accident.

It is denied at the New York offices of the Bethlehem Steel Corporation that the company is to begin the manufacture of automobiles. The corporation has been manufacturing automobile parts, and the department devoted to this class of work is to be enlarged.

The property of the International Power Vehicle Company, of Stamford, Conn., has been sold at public auction for \$50,000 to James W. Cheney, of South Manchester, Conn., T. W. Goodrich and J. W. Downe of New Haven. The sale was the result of foreclosure on a suit by the Empire Trust Company, of New York.

Alterations in the new salesrooms of the Auto Import Company, at 1784-86 Broadway, New York City, importers of the Rochet-Schneider, are approaching completion. In the new repair department two mechanical experts, direct from the Rochet-Schneider works, will be employed. They are now on their way across the water with Mr. Dale, of the Import Company, who has been visiting the factory.

The registration of automobiles in New York State during the month of May broke all records of the kind. No less than 1,863 machines of all classes were registered. For the first five months of 1906, 5,056 cars were registered in New York State. Of these, 4,633 were American machines, valued at \$9,266,000, and 423 were imported cars, valued at \$2,855,250. The total value of all machines registered during the first five months of 1906 was \$12,121,250.

Hiram Percy Maxim, of Hartford, who with a 24-horsepower Columbia won the ten-mile handicap at Readville, Decoration Day, won the first regularly organized automobile race held on a track in this country. This was at the fair at Branford, Conn., in 1898. The race was for five miles, and Mr. Maxim drove one of the early Columbia gasoline models, a two-cylinder water-cooled machine of fairly able accomplishments in its day. His time was something like 12 minutes. There were six contestants.

Before the invention of the shock absorber the hospital patient who had to ride in an ambulance over a rough road had a hard time of it. Jolting is greatly reduced by the device, however, and practical demonstration of this is given by the fact that Mount Sinai Hospital, of New York, has equipped its ambulance with Diezemann shock absorbers; it is said that the ambulance may be driven rapidly over car tracks and rough roads without the usual discomfort to the patient.

The Chas. Abresch Company, of Milwaukee, Wis., well known as vehicle manufacturers since 1871, has built up an extensive business in designing and building automobile bodies, trimmed and finished complete. Starting some six or seven years ago, when the number of motor cars built each year was limited, the Abresch Company has steadily increased the volume of its automobile trade, until now it has grown to be a very extensive part of its total business. The first bodies for the Rambler cars were built by the Abresch Company, and it is building them still—in thousand lots instead of hundreds, however. The latest departure by this enterprising concern is the

building of limousine bodies at moderate prices for individual customers—a practice quite generally followed in France and elsewhere in Europe. Scope is thus given to the special taste of the purchaser of a chassis to select the style of body preferred and allowing an arrangement of the details of same not otherwise to be secured.

NEW AGENCIES ESTABLISHED.

Harry Hurley, formerly with the Washington Automobile Company, of Tacoma, Wash., has taken the agency for the Acme for the state of Washington.

C. B. Rice, representative of the Baker Motor Vehicle Company, of Cleveland, has opened a salesroom and garage at Newport, R. I. The salesroom is located at 100 Bellevue avenue, and the garage on the Merton road, near the Cliff House.

The Automobile Parts & Equipment Company, consisting of H. Beck and L. B. Snyder, as principals, has opened offices and salesrooms in the Southern Hotel building at Michigan avenue and Thirteenth street, Chicago. Several specialties will be represented, among them the products of the Railway Appliances Company.

The Chanslor & Lyon Co., of Los Angeles and San Francisco, have been appointed Pacific Coast agents and distributors for the Harris automobile oils. They carry a full line of all grades, both in barrels and cans. This company has recently made a shipment to Manila of S. H. steam cylinder oils to be used on Stanley cars.

The E. R. Thomas Motor Company, of Buffalo, has just completed arrangements with the Zorn-Strauss Company, of Louisville, Ky., by which that concern will handle the Thomas lines next year. The agency is reputed to be one of the most progressive in that city and will, undoubtedly, give the Thomas line excellent representation.

PERSONAL TRADE MENTION.

Harry M. Burnell, formerly manager of the Chicago Automobile Manufacturing Company, is now associated with Webb Jay, of the White Garage, Chicago. Mr. Burnell is a past master of steam practice, and has designed many valuable improvements in steam cars.

Andrew C. Dam, formerly sales manager for the Gobron-Brillie car in New York, has joined the selling force of the Frayer-Miller. Next fall he will go to Oakland, Cal., where with Albert H. Hayes, Jr., he will represent the Frayer-Miller for the state of California.

W. C. Marmon, of the Nordyke & Marmon Company, Indianapolis, Ind., makers of the Marmon car, visited Boston last week on business. It was Mr. Marmon's first visit to the Hub since he graduated from the Massachusetts Institute of Technology in 1895, and naturally the occasion of the renewal of many friendships formed in schooldays.

Geo. H. Strout has resigned as president of the Western Automobile Company, of St. Paul, Minn., and returned to his old home in New York City. He anticipates taking a well-earned vacation at Little Silver, N. J., before engaging in business. Mr. Strout has been identified with the bicycle and automobile business since 1894 and is considering offers from several of the large automobile factories, with a view of identifying himself with one of them, and also of entering business in New York City, but he is particularly interested in the commercial vehicle business, believing it has a great future ahead of it.

DEATH OF L. F. MEGARGEL.

Percy F. Megargel, the transcontinental Reo automobilist, has had the misfortune to be bereaved by death of his father, L. F. Megargel, of Scranton, Pa., who expired May 26, in that city, after a lingering illness, in his sixty-fourth year. The news of his father's death reached Mr. Megargel by long distance telephone, at a small town in Ohio, where he temporarily abandoned his tour and took the train for Scranton. Mr. Megargel, senior, came of Massachusetts stock, and had been a resident of Scranton for 40 years. For many years he was senior member of the firm of Megargel & Connell, and later organized the banking house of Megargel & Brooks, with which he was connected at the time of his death. A widow and three sons survive him.

TRADE PUBLICATIONS.

KOKOMO RUBBER CO., KOKOMO, IND.—Illustrated catalogue of Kokomo pneumatic tires for automobiles.

A. H. FUNKE, NEW YORK.—Advance circular of imported automobile lamps, gas generators and horns.

IMPERIAL AUTOMOBILE CO., BOSTON.—An attractive bit of advertising in the form of a pack of cards of "vest-pocket" size.

JAMES S. KIRK & CO., CHICAGO.—Circular regarding American Crown soap for washing automobile bodies and the like.

EDWIN B. STIMPSON & SON, NEW YORK.—Of the Clark steam automobile, describing the salient features of the machine.

H. & F. MESINGER CO., NEW YORK.—Circular illustrating and describing a tire with casing made wholly of chrome tanned leather.

AUTOMOBILE SUPPLY MFG. CO., BROOKLYN, N. Y.—Catalogue giving illustrations and brief descriptions of American made automobile horns and lamps.

EDWIN B. STIMPSON & SON, NEW YORK.—Illustrated catalogue of perforated sheet metals, covering a wide range of styles and sizes of perforations.

E. C. WALKER CO., LOUISVILLE, KY.—Large illustrated catalogue of automobile parts and supplies, from a four-cylinder 60-H.P. motor down to a lamp bracket.

JOSEPH DIXON CRUCIBLE CO., JERSEY CITY, N. J.—Interesting and useful pamphlet for those interested in graphite lubrication for automobiles, motorcycles or motor boats.

MORGAN & WRIGHT, CHICAGO.—Catalogue of Morgan & Wright automobile tires, with directions, illustrated, for applying and removing tires with the M. & W. tire tools.

WARNER GEAR CO., MUNCIE, IND.—Illustrated catalogue of Warner spur differential gears in different styles and sizes, and also steering gears of the worm and segment type.

MORSE TWIST DRILL & MACHINE CO., NEW BEDFORD, MASS.—Large and complete catalogue of twist drills, shell drills, reamers of all kinds, twist drill grinders and so on. Also screw cutting tools.

MOLINE AUTOMOBILE CO., EAST MOLINE, ILL.—Catalogue describing in detail the Moline double opposed cylinder 16-horsepower car and four-cylinder vertical 20-horsepower touring car, with practical suggestions on the care and handling of the machines.

CLEVELAND PNEUMATIC TOOL CO., CLEVELAND.—Complete illustrated catalogue of Cleveland pneumatic hammers, riveters and drills, which are made in a large variety of sizes and styles. One of the drills is interesting as having a regular automobile type of miniature sliding gear transmission for obtaining two speeds on drills.

RECENT INCORPORATIONS.

Windsor Automobile Co., Pierre, South Dakota. Name changed to Evansville Automobile Co.

Chester Automobile Co., Chester, Pa.; capital stock, \$15,000. Henry V. Stoeber, Chester, incorporator.

Asheville Automobile and Transit Co., Asheville, N. C.; capital stock, \$10,000. Incorporators: M. G. Guarard, E. P. Brownell, Jr., Fred Ward and M. D. Johnson.

The Gully Auto Co., Hollis, Kansas, to operate passenger and freight automobile; capital stock, \$1,000. Directors, C. J. Gully, R. L. Gully, Jr., and W. D. Gully.

The Motor Car Livery, Philadelphia, Pa., to manufacture, sell, store, repair and rent automobiles. Incorporators, Clarence W. Rowe, Frank G. Kennedy, Jr., R. P. H. Rile, William M. Jones and E. L. Kennedy.

General Vehicle Co., Kerhonkson, N. Y.; capital stock, \$1,750,000. To manufacture automobiles. Directors: Phillip S. Hill, Frank M. Van Wagenen, Charles H. Clark, Edward F. Magoffin, all of New York; B. L. Mason, East Orange, N. J.; M. J. Duffy, Jersey City, N. J., and C. S. Batt, Tarrytown, N. Y.

Acme Wheel & Tube Co., to manufacture tubing and automobile wheels at Saginaw, Mich.; capital stock, \$1,500,000. The stockholders are Pittsburg, Pa., capitalists, those interested being, T. W. McGlone, F. S. Liggett, A. L. Christy, T. M. Hill, J. T. Bealor, S. H. Ross, B. H. Ryder, Geo. F. Mercer, James Stophlet, George H. Everson, William Campbell, E. C. Drum, C. H. Drum, J. E. Masters and D. Lewis. The company has obtained the plant formerly used by the Saginaw Sugar Co., which plant will be re-modeled.

AUTO STAGE LINES.

The Roswell-Torrance automobile passenger line in the Estancia Valley, New Mexico, has five machines in constant use and is hardly able to handle the business offered.

The Toledo Touring Car Co., of Toledo, O., will shortly place in service a sightseeing automobile for "Seeing Toledo" trips. It is expected that other cars will be added later.

Trenton, N. J., has a big sightseeing automobile which will be in operation shortly. In addition to carrying sightseers, the machine will be chartered to private parties.

A twelve-passenger automobile has been ordered to ply between Ripon, Wis., and Green Lake, a distance of six miles. Mrs. C. F. Simmons is the promoter; if the first car proves a success additional cars will be put on.

A San Francisco concern has received an order from its branch house in Japan for twenty-four automobiles. Fifteen of the machines, carrying ten passengers each, will be used as street cars in Osaka, Japan, where five machines are already engaged in this class of service and making a profit.

An automobile stage line will shortly be in operation between Neffs and New Tripoli, Pa., via Newside and Saegersville. A company has been formed for the purpose by E. A. Krause, Jacob B. Waldelech, George Shoemaker, Oliver Shoemaker, Nadig Brothers, Henry Solellac and George Hammer. A car has already been purchased.

The recently incorporated Asheville Automobile and Transit Co., of Asheville, N. C., expects to have passenger automobiles in operation early this month, between that city and Rutherfordton. The machines will be used as sightseeing cars and will run over regular routes, starting from a common central point.

NEW GARAGES ESTABLISHED.

The building that was formerly the home of the Chicago Automobile Club, at 243 Michigan avenue, Chicago, has been leased for a term of two years by Owen H. Fay, president of the Owen H. Fay Livery Co. and will be fitted up as a garage. The company operates twenty automobiles in connection with its livery business, and these cars will be stored at the new place, which will be a convenient place for those who wish to leave their cars down town.

A handsome new automobile garage has been completed at Portland, Oregon, and is occupied by Covey & Cook. It is the finest garage in the Northwest, having a floor area of 30,000 square feet and accommodation for 150 large touring cars. The firm has recently received and placed several of the latest models of Pierce-Arrow, Stevens-Duryea, and Cadillac cars, which are finding a ready market now that the weather is warming up. They anticipate a record year.

PROSPECTS IN SAGINAW.

Saginaw, Mich., June 4.—Automobile prospects for Saginaw for the coming season are exceedingly bright. There are now three automobile companies in the city. These are the Norris Automobile Company, the Beck & Fisher Company, and George J. Bohnet & Company. Reports from each of these show prospects for a banner year of sales. In fact, it is said that owing to the number of advance sales it may be hard to get an automobile in Saginaw this season unless the order is in early.

NEWARK'S MOTOR MART.

Newark, N. J., June 4.—This city has three automobile concerns that have set aside old-fashioned ideas and are housed under one roof. The concerns are the Newark Garage and Repair Company, the Calvert-Zusi Company, and the Autovehicle Company. A building at the junction of Clinton and Elizabeth avenues, 50 by 200 feet, with two floors, has been purchased by the Newark Garage and Repair Company, and the other two concerns housed in the structure rent from them. The Calvert-Zusi Company has the store on one side of the main entrance to the building, while the Autovehicle Company occupies the other.

Each of the three has its own particular line of business, and will not interfere with the others. The Newark Garage and Repair Company does nothing except repair and store automobiles and sell tires and accessories. The Calvert-Zusi Company handles the Winton car, while the Autovehicle people are agents for the Thomas and Franklin cars. The two last-named concerns sell only, and do no repairing or storing.

The location of the new garage is in a section of the city very much patronized by automobilists. Clinton avenue, Elizabeth avenue, and the several other streets that converge at that point are asphalted and form the natural route for motorists passing out of the city southward to Irvington, Springfield, Elizabeth, Plainfield, New Brunswick, Trenton, and Philadelphia, when they desire a fine road rather than the saving of a couple of miles in distance.

Some time ago an attempt was made to centralize the industry on Halsey and Broad streets, either side of Market. Three or four dealers were already established in that section, and a fine three-story brick building was erected by a man identified with the trade especially for automobile dealers. For awhile it looked as though all the large agencies might locate there, but the scheme fell through. Now there are three well-defined automobile centers here.

INFORMATION FOR BUYERS.

NEW TIRE PROTECTOR.—The pneumatic tire's inherent weaknesses, due to the comparatively fragile material of which it is made, afford this inventor a wide field for ingenuity, with a sure reward if the object sought is attained. This is amply proved by the great number of tire protectors, anti-puncture devices, non-skidding treads and similar devices in use. Though nothing is



NOMRAH TIRE PROTECTOR FITTED.

yet perfect, progress is being made constantly, and the manufacturers of the Nomrah tire cap believe that their device is a long step forward. The device is manufactured by the Harmon Manufacturing and Distributing Co., of 285 N. Carpenter street, Chicago, and consists of a tread made of fine rubber and a specially woven fabric, which is slipped over the tire and held in place by contractible steel cables in the edges of the cap. The cap is put on when the tire is deflated, and when the tire is pumped up to riding pressure the caps are securely held in place without visible means of fastening and without vulcanizing or cementing. The manufacturers state that as only the actual tread of the tire is covered by the cap, there is no loss whatever of resiliency; also, that the application of the cap to an old and nearly wornout shoe makes it nearly as good as a new tire, as long as the fabric is intact. The cap does not need to be put on at the factory, but can be attached by anyone; as the accompanying illustration shows, it does not detract from the appearance of the tire to which it is applied.

WORM STEERING GEAR.—Keeping in mind the fact that the first requisite of an automobile steering gear is that it should be safe—for the lives of the occupants of the car often depend upon the integrity of the steering gear—the Boston Gear Works, of Boston, Mass., has brought out a worm and segment steering gear that embodies a number of excellent features. Both worm and segment are of steel, the latter being a drop forging, and both are case-hardened to a depth of 1-32 inch. The casing inclosing the gear is in two parts, bolted together, and may be of castiron or of aluminum. In addition to being dust and waterproof, the casing contains oil, in which the gear works, so that there is no question as to the thoroughness of the lubrication. Excessive lost motion in a steering gear is irritating and sometimes positively dangerous, and in

gears of the better class means for adjustment are provided. In the gear in question the bushing in which the sector shaft runs is eccentric, so that when it is partly rotated the sector is caused to close in on the worm, taking up wear in this direction. End play is taken up by a nut at the bottom of the steering column. The connection at the foot of the column is so arranged that the rod can be given either a lateral or a longitudinal motion.

STORAGE BATTERIES.—Small storage batteries for ignition work for automobiles and launches, and for small electric lighting of all kinds, are the specialty of the Evansville Battery & Electrical Company, of Evansville, Ind. The Porter batteries made by this concern have hard rubber jars of unusual strength, reinforced where stresses are likely to occur. The cover is also of hard rubber and rests on a shoulder formed inside the jar. A large vent hole is fitted with a screw plug containing holes that are staggered to prevent the slopping out of the electrolyte. Plates are very heavy, and the manufacturers state that the active material is very securely held in position in the grids. Connections between plates consist of strips of a lead alloy, and no solder is used in making connections. Cells are inclosed in outer casings of

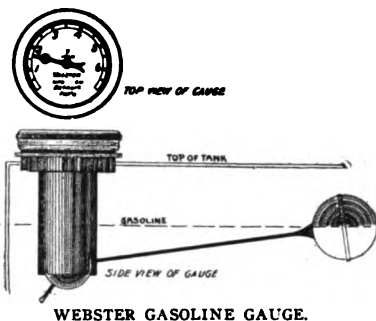
heavy quartered oak with dovetailed corners; a strong leather carrying handle is attached by means of nicked cleats. The terminals, extending through the case, are marked plainly. The case has a hinged cover, which is to be opened when charging the cells. Porter ignition battery No. 1 has been tested on a two-cylinder car, and the manufacturers state that it ran the car 3,800 miles before requiring recharging.

SELF OPENING GATE.—It is anything but a pleasant task to get out of a car into a muddy or dusty road to open a gate, and again to close the gate after passing through, and this is rendered unnecessary by the use of automatic gate openers. Such a device is the Manlove self-opening gate, manufactured by the Manlove Gate Co., of 272 E. Huron street, Chicago. The gate is hung on a ball-bearing hinge and is opened by the front wheel of the car passing over a trip placed at a little distance. The operating apparatus is simple and is all above ground. A similar trip on the opposite side closes the gate, leaving the trip ready to open it again for the next arrival.

CHARGING STORAGE BATTERIES.—A very convenient device for those who desire to charge their own ignition storage batteries from incandescent lighting circuits has been placed on the market by the Benjamin Electric Manufacturing Co., of New York, Chicago and San Francisco. The device consists of a special lamp cluster socket for carrying three incandescent lamps and the necessary cables for carrying current to the battery. The apparatus is attached to the ordinary electric light socket. If used on a 110 volt circuit, the battery can be charged at a 3-ampere rate of three 32-candle-power lamps are used, and at a 1 1-2-ampere rate if three 16-candlepower lamps are used. The removal of one or more lamps decreases the charging rate proportionately. The illustration shows the general appear-

ance of the outfit when connected up for use.

WEBSTER GASOLINE GAUGE.—An instrument for showing at a glance the depth in inches of the gasoline in the tank. The illustration shows a top view of the dial of the gauge, also a side view of the appliance when fitted in the tank of an automobile. The ball float shown in the diagram at the end of the long arm is positive in movement, and transmits motion to the pointer

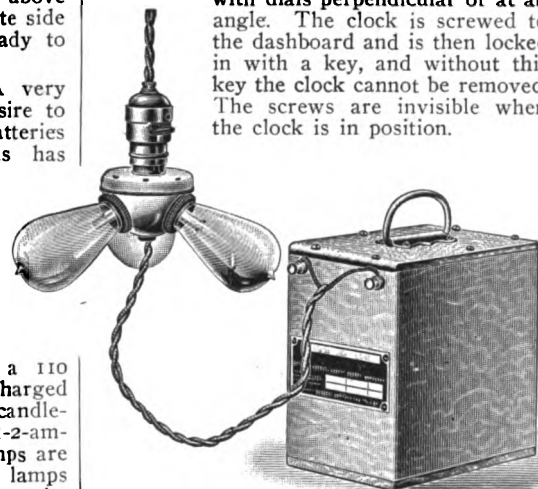


WEBSTER GASOLINE GAUGE.

shaft by means of simple gears. All parts are in brass and steel, and the dial is silvered, with plain black markings. The gauge is furnished with proper-sized dial and float arm for different sizes of tanks, and can be readily fitted. It is manufactured by the Webster Manufacturing Company, 253 Jefferson avenue, Detroit, Mich.

TIRE RELIEF VALVE.—A novel combination of compound tire pump and relief valve for preventing excessive pressures in pneumatic tires is the "Safety" pump and valve manufactured by the Artizan Brass Co., of 118 Michigan street, Chicago. The pump is of the compound type, having two cylinders, one for low pressure and the other for high pressure; and to the hose coupling at the base of the pump is attached an automatic valve which can be set to blow off at the pressure desired in the tire. In this way there is no possibility of pumping the tire up harder than is intended, and all tires can be inflated to an equal degree. One of the features of the pump is that no oil is required in it, a dry lubricant being used; the danger of getting oil into the tire is thus obviated. The rapid deterioration of rubber under the action of oil is well known.

AUTO CLOCKS.—A clock that cannot be stolen from the car, but can nevertheless be wound and set from the outside without trouble, is manufactured by Manasseh Levy & Co., of 182 Broadway, New York, under the name of the Safety Auto Clock. This clock is made in several sizes and styles, with dials perpendicular or at an angle. The clock is screwed to the dashboard and is then locked in with a key, and without this key the clock cannot be removed. The screws are invisible when the clock is in position.



STORAGE BATTERY CHARGING SOCKET.

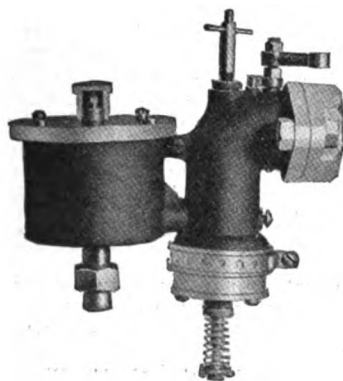
INFORMATION FOR BUYERS.

RADIATOR AND CARBURETER.—Two very interesting automobile accessories, embodying some features that are new in their application, have recently been placed on the market by the Motor Components Manufacturing Company, of Des Moines, Iowa. These are a radiator and a carbureter, or



ARCTIC RADIATOR.

carbureter, as the manufacturers prefer to call it. The radiator is known as the Arctic radiator and is of inherently substantial construction, consisting of two copper sheets, perforated with many holes, into which beaded copper tubes are expanded after the manner of boiler tubes, the resulting structure being very strong and watertight without the use of solder. So far, however, the Arctic radiator is not new. The novelty consists in inserting in each of the tubes a second tube having a star-shaped cross section; these inside tubes are of such size that the star points fit tightly against the inner walls of the round tubes



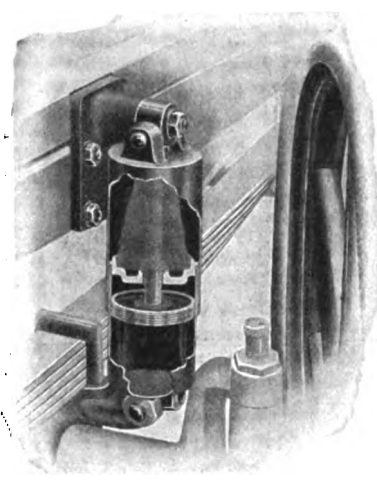
SUPREMUS CARBURETER.

and are thus retained securely in position. The inner tubes are used for exactly the same reason that disks or flanges are used on the outside of a common radiator tube—to absorb heat from the round tubes and expose it to the passing air. The radiating surface of the cooler is very greatly increased by this plan—175 per cent., according to the manufacturers. The front and back sheets are of 24-gauge copper, polished; baffle plates are placed in the course of the water so that the full benefit of every part of the cooling surface is obtained. The cooler is decidedly attractive in appearance.

The carbureter, called the Supremus Carbureter, is of the float feed type, and has an automatic auxiliary air valve in the bottom of the mixing chamber. The spray nozzle can be adjusted by a needle valve working downward from the top of the mixing chamber; instead of a single comparatively large gasoline opening, there are ten minute

holes, so that the spray is very finely divided, and is further diffused by striking against the cone of the needle valve. The manufacturers claim many important advantages over other carbureters, based on practical tests. Adjustments of every part can readily be made, and the gasoline and air inlets can be adjusted from the driver's seat by means of universally jointed rods. A disk throttle is placed in the outlet of the mixing chamber.

PNEUMATIC SHOCK ABSORBER.—Springs are about as essential to the pleasure automobile as the motor itself; but springs, like the motor, need throttling or governing, in order to prevent the skyward rush of passengers that follows the violent expansion of a set of springs after a sudden compression. A device intended to place a check on the too energetic action of springs is made by the Kilgore Automobile Air Cushion Co., of 46 Columbus Avenue, Bos-



KILGORE AIR CUSHION.

ton, Mass., and is here illustrated partly in section. It consists essentially of a cylinder, in which works a piston; the cylinder is attached to the axle or spring, and the piston to the frame or body of the car, swivel joints being employed to allow for lateral movement and prevent friction and binding. To the piston rod is attached a second cylinder which slips over the working cylinder and fitting closely, forms a dust shield and protecting case. There are no valves, the piston simply working against the air cushions formed by the ends of the cylinder. The working cylinder and the piston are cast from phosphor bronze; the piston is packed with metallic rings and with leather, the latter hugging the cylinder walls closer as the pressure increases. The outer cylinder or dust shield is of seamless drawn brass tubing. Brackets and connection fittings are made of high-grade steel castings.

TRUNKS AND NUMBERS.—License numbers are absolutely necessary adjuncts to the automobile, and trunks or hampers for carrying the passengers' personal belongings are almost as indispensable, so far as the car *en tour* is concerned. Both are made in variety by John Boyle & Company, of 112 Duane street and 70 Reade street, New York City. Trunks are made in special forms for cars of standard design, and have steel frames and high-grade leather coverings; the manufacturers state that the Boyle trunks are thoroughly waterproof. Covers

can be provided to protect the trunks from the effects of the weather on their appearance. License pads, lamp numbers and tool kits are also made by this concern, the tool kits being of the roll type. Leather splash aprons and other leather goods are made in variety.

CONVENIENT FIRE EXTINGUISHER.—The difficulty of extinguishing a fire of gasoline or oil with water makes is very desirable that where there is any possibility of such a blaze, effective means should be at hand for putting it out. Such a means is supplied by the Lightning fire extinguisher, manufactured by the Suffolk Chemical Company, of 170 Summer street, Boston, Mass. This extinguisher consists of a tube filled with a dry powder and the open end is fitted with a stopper; in the stopper is a ring for hanging the device from a hook or nail. When it becomes necessary to use the extinguisher, the "fireman" grasps the tube and merely pulls it away from the stopper, when he is ready for instant action. The powder is thrown on the base of the blaze, and the results are said to be remarkable. The Lightning extinguisher is made in two sizes—20 inches long and 24 inches long.



NEW AGENCIES ESTABLISHED.

The Franco-American Auto and Supply Company has been organized to deal in automobiles in Chicago.

The South Broad Street Automobile Company, of Philadelphia, has been appointed selling agent for the Gale in that city.

The Motor Vehicle Company, of Newark, has been appointed agents of the Aerocar for Union, Essex, Middlesex, Somerset, Monmouth, Sussex, and Mor counties of New Jersey.

The G & J Tire Company has opened a New York branch at 610 West Sixtieth street, with A. T. Smith, who has been connected with the company for several years, as local manager.

The Bartholomew Company, Peoria, Ill., has opened a branch house at 131 and 133 West Second street, Des Moines, Ia., in charge of S. W. Leonard, for the sale of Glide cars.

The Michelin Products Selling Company, of New York, has established a branch at 265 Jefferson avenue, Detroit, Mich., which will be managed by H. W. Wolcott, formerly of the Goodrich Detroit branch.

The Milwaukee Rubber Goods Company, of Cudahy, Wis., has granted exclusive selling agencies for the sale of its *Fast* airless automobile tires to the following: White & Wildman, 1551 Michigan avenue, Chicago; W. E. Kaiser, 1512 Locust street, St. Louis; Boston Tire & Rubber Co., 184 Friend street, Boston; Cincinnati Carriage Goods Co., 840 West Sixth street, Cincinnati; Fulton Avenue Motor House, 110 Fulton avenue, Rochester, N. Y.; J. B. Maxwell, 829 Fourteenth street, N. W., Washington, D. C.; Phil G. Anderson, Detroit, Mich.; J. O. Todd, Southboro, Mass.; Appel & Brounell Tire & Rubber Co., Dallas, Tex.

ENTRIES FOR VANDERBILT CUP.

American candidates for the team that will represent this country in the Vanderbilt Cup race are now coming forward in view of the proximity of July 1, the closing date for entries. Though Chairman J. D. Thompson has gone to the other side to witness the Grand Prix race in France, entries directed to him at 26 West Twenty-seventh street, New York City, receive prompt attention. The probable list now includes the Pope-Toledo, B-L-M, Matheson, Oldsmobile, Frayer-Miller, Wayne, Haynes, Apperson, Stanley, Locomobile, with several others practically assured. Three or four concerns will enter more than one car.

The "Wayne Twins" Ready for the Fray.

The "Wayne Twins," the two cars of the Wayne Automobile Company of Detroit, have been shipped to New York, and their drivers will become acquainted with the course thoroughly before the elimination race of September 22. The Wayne racers have the regular stock chassis of the 50-horsepower touring car, though some minor changes and modifications, of course, have been made to enable the car to stand the terrific strain of a hard road race. These changes, however, the Wayne company states, it will make if desired on any Model F car which it sells.

Concerning the Haynes and Apperson Entries.

KOKOMO, IND., June 11.—The two automobile factories of this city are making preparations to participate in the Vanderbilt race. Last year the Haynes Automobile Company entered a car that was one of the five finishers in the preliminary race, but the commission displaced it with a machine it had defeated. This year, before the Haynes company would agree to make an entry, it learned positively that if the Haynes won a place on the American team in the elimination it would be one of the starters in the cup event in October.

Plans have practically been completed for the Haynes car, which will be equipped with a 50-horsepower engine and will be capable of developing a maximum speed of 75 miles an hour. Frank Nutt will drive the car.

Apperson Brothers will enter an 80-horsepower car with a maximum speed of from 85 to 90 miles an hour, and it will be driven by Edgar Apperson. Detailed plans of the construction of the two cars have not been given out.

Under Colors of Columbus Automobile Club.

COLUMBUS, O., June 11.—The Frayer-Miller car which will participate in the Vanderbilt Cup race will carry the colors of the Columbus Automobile Club.

FRANCE AND THE VANDERBILT CUP.

PARIS, June 3.—"Officially the Automobile Club of France ignores the existence of the Vanderbilt Cup Race," said Secretary Sautin of the Sporting Commission to THE AUTOMOBILE representative. The attitude of the French club is summed up in this brief sentence. Previous to the holding of the 1905 Vanderbilt race the A. C. F. announced that, whatever might be the result of the contest, it would not again send a team over the Atlantic for the great American race, and the present policy is but the carrying out of this resolution. Asked if the club would not undertake to transmit entries for the Vanderbilt Cup, M. Sautin said, "No; French constructors desiring to engage in the race must make their own arrangements; we as a club have nothing whatever to do with the matter."

"But if the number of French cars is too high and elimination is necessary to obtain a team, would the club interfere?"

The reply to this query was that possibly in such an eventuality, if requested to do so, the club committee would select a team from amongst those desiring to enter.

Although the club washes its hands of the event, French constructors show more interest, and there is every possibility of a good team being sent over.

The arrival of Chairman Thompson of the Vanderbilt Cup Commission is awaited with interest.

PERCY PIERCE IN THE HERKOMER.

Late reports concerning the Herkomer tour, starting June 6 from Frankfort-on-the-Main, thence going to Vienna, and concluding at Munich, give creditable news concerning the driving of Percy Pierce, the only American in the run and the winner of the 1905 Glidden trophy. The representative of the Automobile Club of Buffalo, driving the Great Arrow, reached Vienna with a perfect score.

The tour finished at Munich on Tuesday afternoon. This was one of the early arrivals, and, since he did excellently, it is probable that when the general result is determined he will be among the leading cars.

VERMONT'S HORSE AND AUTO SHOW.

RUTLAND, VT., June 11.—The Inter-State Horse and Automobile Show which was brought to a close here last Thursday, after a meeting of two days, was a success in regard to crowds, enthusiasm, and fine exhibits, in spite of the rain, which fell almost without intermission throughout the entire show. The spectators were estimated on the second day at 4,500. The oval in front of the grandstand was covered with a thick coat of mud, but the distribution of sawdust made exhibitions possible.

POPE ADVISES AUTOISTS TO GO SLOW.

ROME, June 9.—Archbishop Farley, after yesterday's audience, expressed admiration for the Pope's familiarity with American affairs. The Pontiff's health, said the archbishop, was good, and he showed no trace of his recent illness. When Archbishop Farley presented Mr. and Mrs. John B. Manning, of Buffalo, and mentioned that they were automobiling through Italy, the Pope, shaking his head, said they indeed had need of a blessing. Then turning to them he added: "May you have no collisions and no accidents. God bless you, but go slow."

DISTURBED QUAKER CITY'S REPOSE.

PHILADELPHIA, June 11.—The passage last Thursday of an ordinance introduced by Jacob J. Seeds a few weeks ago makes it illegal for automobile operators to sound siren or Gabriel horns on the streets of the city. The penalty for each infraction is \$10. As a result there has been a general discarding of the mournful "day of judgment shriekers" and the substitute of the quiet and inoffensive "honk-honk."

Another ordinance which will in all likelihood go through to final passage and become a law is that requiring the carrying of drip pans under automobiles to prevent the trailing of oils and greases upon the asphalt. This bill was introduced in the interest of the local S. P. C. A., the officers of which aver that many accidents have resulted from horses slipping on the numerous grease-spots which mar the surface of those streets especially affected by automobilists, North Broad street in particular.

LARGER COMMISSIONS DESIRED IN NEW YORK.

Twenty per cent. commission on the sale of automobiles in New York City is too small, according to a number of dealers who are members of the New York Automobile Trade Association, and a general meeting of the association will be called in a short time to discuss the matter, with a view to obtaining larger margins of profit from the manufacturers. Expenses are high in New York, say the dealers, and the up-to-date automobile sales-room is an expensive institution to maintain properly, so that a profit that might be fair in places where rents and other charges are low would be slender in New York.

A meeting of the New York Automobile Trade Association was held on June 7, when the announcement was made that after paying all expenses of the open-air show at the Empire City track, there was a sufficient fund to pay members who were exhibitors a rebate of 20 per cent. on the cost of their spaces. The association treasury is \$1,000 richer than before the show.



JULIUS BEUTLER IN 40-HORSEPOWER MARTINI.

bruck, 331 kilometers; and June 12, Innsbruck to Munich, 140 kilometers.

An exhibition will take place at Vienna on June 9 of all the cars taking part in the contest, and on June 13 the prizes will be distributed at Munich.

A hill-climbing competition will be held at Semmering on June 10, the rise being 500 meters in seven kilometers. On June 12 a speed competition will be held in the Forstenrieder Park. During the hill climb and speed test the autos must be driven by their owners. During the rest of the journey the chauffeur may drive, but the owner must always be on board. A commissaire is carried on each car to see that the regulations are observed, and at the end of each stage the machines must be handed over to the person in charge of the control station.

Scenes of Interest at the Starting Line.

The greatest animation reigned at the starting line on the borders of Frankfort when at 5 o'clock the mass of autos made music with their horns and exhausts. Prince Henry of Prussia received his share of popular applause, and as well-known motorists went away cheers and cries in various tongues followed them. At the outset protests were lodged against the scanty bodywork of some of the competitors, the Fiat cars which ran in the Milan Golden Cup contest being especially objected to on this account. After much discussion the Italians had to withdraw, but finally decided to run in the contest, although not officially recognized as competitors.

Benz and Daimler machines are the favorites. Sorel, winner of the Pyrenees Cup, with a 24-horsepower De Dietrich is looked upon as the champion of the French team, and the English squad, among which is one lady, Mrs. Edward Manville, is known to have sworn to win or die. The solitary Pierce car attracted



PRINCE HENRY OF PRUSSIA IN 40-HORSEPOWER BENZ.

considerable attention by reason of its being the first American machine to compete in a European touring contest. The winner of the cup last year, Edgar Ladenburg, was unfortunately unable to start owing to his machine having been seriously damaged in a collision in Frankfort as he was making for the starting line.

The organization of the contest is all that the most fastidious could desire. The road is guarded by soldiers, and at various distances are men with flags to point out the route and signal dangerous points. A blue flag indicates a dangerous portion of the road, a yellow flag indicates danger necessitating a stoppage. A member of the royal family is on board one of the cars, and as it is impossible to distinguish his highness under goggles and automobile clothing, respect is shown to all the competitors; stones never fly. The German roads are not everywhere as perfect as the German organization, but this will only more thoroughly test the cars, and the American competitor will certainly not grumble at having to run over rough surfaces.

CABLE REPORTS OF HERKOMER WINNERS.

Starting last in the Herkomer competition, after 154 cars had set out on the journey, Dr. Robert Stoess, of Zwickau, was awarded the first prize, to the astonishment of all contestants and spectators. His machine was of only 20 horsepower. Second prize went to Emil Neumaler, of Stuttgart, who drove a 40-horsepower car, and third prize to Herr Willy Poge, of Chem-



CHARLES HARDY IN 45-HORSEPOWER DAIMLER.

nitz, with a 40-horsepower car. The cablegrams do not state the makes of the winning cars. Percy Pierce, driving the only American car in the event, a 40-45-horsepower Pierce Arrow, is not named among the first ten, nor was Prince Henry of Prussia. Advices from Mr. Pierce state that his car made a clean record for the tour. In the absence of definite information, it is thought that the car was handicapped in the speed trials which were a part of the Herkomer contest, because of the high power of many of the continental cars, and that beauty of contour, which was also a factor, was considered from a continental standpoint, to the detriment of the American competitor's chances.

Cable information from English sources states that three of the Herkomer prizes were carried off by English Daimler cars. One of these, a 35-40-horsepower car, was driven by Mrs. Manville, an Englishwoman, and was awarded a prize of honor. Another of 28-36 horsepower, driven by Mr. Grigg, received a gold medal, while a third, driven by Lord Montagu, also received a gold medal.

Two accidents have been reported. Curiously enough, in both cases the cars concerned were rounding curves near Nuremberg on the first day and each struck a tree; in each case an occupant of the car was thrown out and his skull fractured. One of the men injured was an official observer. Arthur Blackburn, an English competitor, was forced to abandon the contest on the first day, owing to the disablement of his car.

ROCHET-SCHNEIDER TOURING CONTEST.

PARIS, June 6.—Some additional interest was attracted to the third annual contest for the Rochet-Schneider trophy by reason of its being held over the famous circuit on which last year's Gordon Bennett race was run. The difficult nature of the road was so much talked about at that time for its horseshoe curves on steep grades, stiff climbs and long, winding descents as to be still familiar to all; and it was on this wild mountain course that the tourists had to prove their mettle, 300 points being awarded for regularity of running, 200 points each for fuel consumption, hill-climbing power, highest average speed, price of chassis, and 100 points for water consumption.

Nineteen cars started, consisting of two Peugeots, one Brouhot, two Bayard-Clements, three Heralds, four Rochet-Schneders, two Mieussets, three La Buire, and two Pilains, eighteen of which officially finished the 198 miles run. Perret on a Peugeot machine headed the list with the maximum number of points, 1,200, and thus secured the cup for the second year in succession. The winner's fuel consumption was 2.57 gallons for 62 1-2 miles. For the total run the fuel consumption was 5.8 gallons. The importance of this performance will be realized when it is remembered that the 198 miles consisted of difficult mountain roads with several 13 per cent. grades. The Bayard-Clement cars also made a good showing on the fuel consumption test, their record being 8.1 gallons for 198 miles, covered at an average of 19 miles



BRANDON IN 40-HORSEPOWER OPEL-DARRACQ.

an hour, and 2.55 gallons for the 62 1-2 miles on which the fuel consumption was officially controlled. This latter portion covered the famous La Baraque hill, four kilometers of which have a 13 per cent. grade.

So keen was the competition that it was only the fuel consumption and catalogue price which determined the classification. For regularity of running, hill climbing, and loss of water, the competitors formed a compact group.

The hill-climbing test was held over a four-kilometer course to be covered at a speed of 18 3-4 miles an hour. Two hundred points were awarded for this, while failure called for the deduction of points.

PERCY PIERCE IN A SERIOUS COLLISION.

After having passed through the Herkomer competition with a fine record, Percy Pierce, of Buffalo, the only American competitor in the event, collided with a carriage while returning from the contest, at Wertheim, near Frankfort. Two men were in the carriage, and one was killed and the other injured seriously. The automobile was much damaged.

Mr. Pierce and an American friend, Mr. Custrey, who was with him in the car, were detained, and will remain at a hotel in a neighboring town until the amount of their bail shall have been fixed by the authorities.



PERCY MARTIN IN 35-HORSEPOWER LEON BOLLEE.

MORNING PAPERS AT THE GRAND PRIX.

Duplicating the exploit of last year, several leading Paris dailies will be delivered in the early hours of the morning on the course of the Grand Prix race of the Automobile Club of France. This year the Paris edition of the *Herald* undertakes the enterprise in connection with *Le Matin*, a representative French daily. The distance between Paris and Le Mans is 210 kilometers. The vehicle chosen for the fast delivery is a 60-horsepower Mercedes, especially equipped by C. L. Charley, the "Mercedes man," of Paris. Paul Sartori will be the driver. He expects to make the run in about three hours, that is, leaving Paris at the Porte Mailot gate at 4 o'clock in the morning, and reach Le Mans at about 7 o'clock. On the different points of the course, at La Fourche, at Bonneval, at Connerre, scores of cyclists will be ready to take bundles of papers and distribute them in their respective districts.

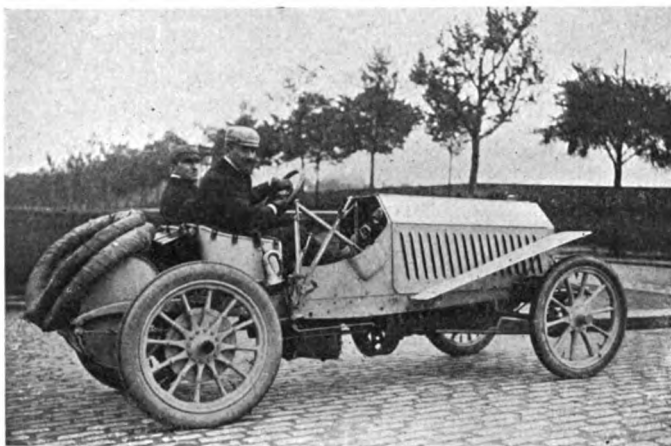
Everybody remembers how successful was the first attempt made last year when the fashionable sea places, Deauville and Trouville, were supplied with the newspaper before breakfast time. At Le Mans, as well as on the French coast, the newspaper trains do not arrive before the early afternoon.

NO EUROPEAN CIRCUIT THIS YEAR.

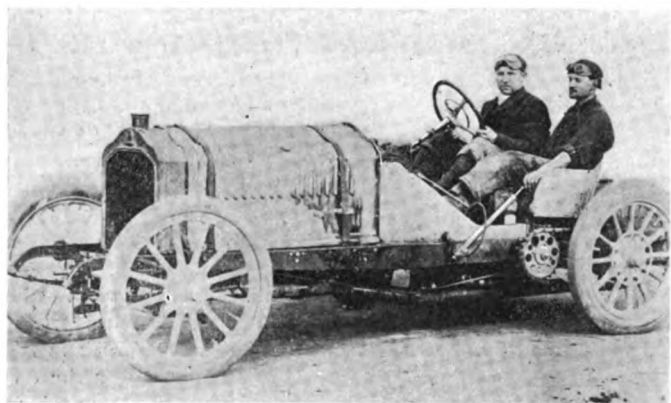
It is now certain that the European Circuit touring contest will not be held this year. All the national clubs interested in the event have agreed to the proposition of the German Imperial Automobile Club to postpone the tour until next year. The matter has yet to be submitted to the Automobile Club of France for sanction, but this is only a formality, and all entries have been canceled and engagement fees refunded.



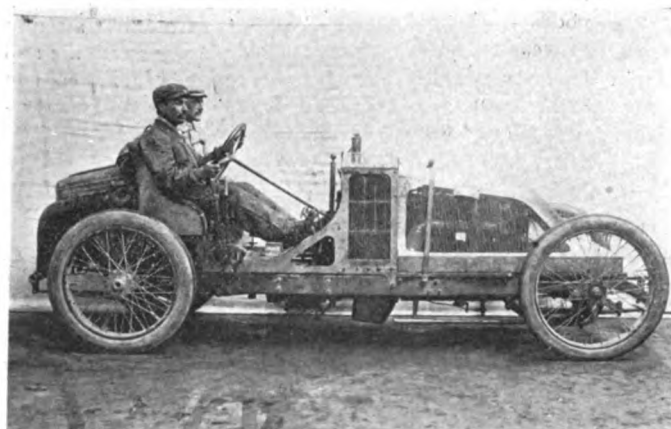
HERR BRAUNBECK IN 35-HORSEPOWER MERCEDES.



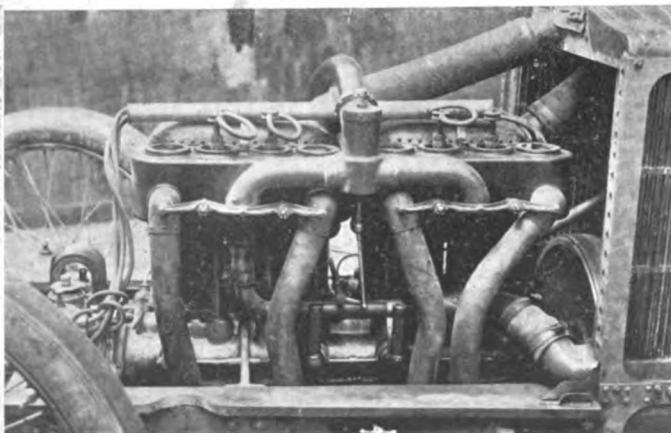
PANHARD TESTING THE GRAND PRIX COURSE.



DURAY IN 130-HORSEPOWER DE DIETRICH.



SZISZ IN HIS WIRE-WHEELED RENAULT.



110-H.P. RENAULT MOTOR, THERMO-SIPHON CIRCULATION.

BEFORE THE GRAND PRIX.

Just received from our Paris correspondent, the following specifications on the two Gregoire cars that are said to have a splendid chance in the Grand Prix will prove interesting: Bore, 140 mm.; stroke, 130; indicated power, 70-horsepower; flat tubes radiator, thermo-siphon cooling system, straight cone clutch with bolts, coupling rod before the front axle; diameter of wheels—front 810x90; rear, 820x120. Cardan shaft transmission; 130 liters gasoline tank. The machine weighs 750 kilos. Ignition by Nilmelior magneto with plugs and transformers. Shock absorbers Gardy-Batault, working in oil.

Albert Clement is now through with his trials on the Grand Prix course. In a letter just received here by a friend of his, the young driver says he is perfectly delighted with his machine. His special Bayard-Clement racer has withstood a series of trips of four to five hundred miles, without a screw loosening. The car is exceedingly fast and covers the kilometer in less than 23 seconds. It is also extremely strong, and the cooling is perfect. Albert Clement, Villemain, and de la Touloubre, the three stars of the Clement-Bayard team, are said to have covered the kilometer several times between 22 and 23 seconds.

The tarring of the road is completely finished at the time of writing. The Automobile Club of France's grandstand is in course of construction, and expected to be erected by June 22. The work of the tunnel that passes under the Paris road at the hectometrique stone No. 32, and which gives access to the stands, is already finished. The stands in Saint-Mars-la-Briere and Champagne will also be ready early. At the La Fourche turn the cement-raised bank is completed.

The following are important features culled from the rules edicted by the Sportive Commission of the A. C. F. June 7, relative to the weighing in of the cars and formalities in the "closed parks" between the two stages of the race:

- 1.—The cars must be at the scale on June 24 from 9 o'clock in the morning to 7 o'clock at night.
 - 2.—They shall be accompanied by the team competing in the first day of the race.
 - 3.—The car must be brought in complete readiness.
 - 4.—The weight of the car, all tanks empty, shall not exceed 1,000 kilos, 7 kilos in excess being tolerated as stipulated in Article 12 of the rules. (Magneto).
 - 5.—If the passengers (driver and mechanic) do not weigh the stipulated 120 kilos, the difference will be completed by means of a sack of sand closed by a lead seal bearing the name of the driver. The driver will be requested to show the sack with the lead seal bearing his name at the time of the two starts.
 - 6.—The tires on the wheels will be marked with a hot iron as well as all those fixed on the car.
 - 7.—The chassis will be marked by means of a steel stamp and a hammer on the four wheels (hubs and one spike); on the left rear hand spring, on the right front hand spring, and on the top and underneath the gear case.
 - 8.—A competitor will be obliged, after having filled his tanks, to operate the car before the commissaires. A few yards forward and a few yards backward will be required for that examination.
 - 9.—A competitor will be obliged to crank his motor and make it work at full admission (throttle wide open) before the commissaires during a few minutes, and if the exhaustion blows away the sawdust placed underneath the motor, the driver will not be permitted to start.
 - 10.—Every driver will be compelled to produce a certificate signed by the clerk of the course and attesting that he knows the circuit entirely.
 - 11.—The number will be painted in a very apparent manner on the radiator, at the front, and on the tank, at the rear, and must be visible at the distance of at least 150 meters.
 - 12.—Every car having completed the distance under the limit time, the first day, will be immediately taken into the custody of a commissaire, who will cause it to be brought by hand into its special stall in the closed park and locked so that nobody will be permitted to approach it.
 - 13.—As soon as his motor is stopped the driver will be authorized to do only one thing, that is shut his gasoline and oil cocks, and then leave his car in the care of the commissaires.
 - 14.—On the morning of the second day the cars will be remitted in the hands of their respective teams at the instant of the start only.
 - 15.—All operations relative to the cranking of the motor, general supply, repairs, etc., will not be allowed to be effected before the start is given.
 - 16.—At the end of the second day, the competitor having finished under the limit time, and, consequently, fit for classification, will leave his car in the care of the appointed commissaires, who will inspect it all over, weigh it, and conduct it to the closed park.
- Messrs. Rene de Knyff, de Vogue, Loysel, and de la Valette were this week in Le Mans, where they had a conference with the Prefect of La Sarthe regarding the definite text of the report to be addressed to the Minister of Interior, M. Etienne Giraud.

LONG ISLANDERS HOLD THEIR ECONOMY TEST

MUD, rain, steep hills and miserable roads made the second reliability and economy contest of the Long Island Automobile Club, of Brooklyn, a run to be remembered and talked about for many a day. The showing made by the competing cars was exceptionally good, the machines plowing through the mud and driving through the storm without hesitation. For the most part it was anything but a pleasure



S. H. BURNS IN 24-H.P. PACKARD, WINNER OF FIRST PRIZE.

trip, and those who competed must have been animated by a spirit of true devotion to the sport.

Fifteen Cars Started.

On Saturday morning fifteen cars started from Cumberland street, Brooklyn, for the two days' trip of 173 miles to Poughkeepsie and return. There were twenty entries, but five did not start. Ten cars finished the run. The starters were as follows:

Alfred Wilmarth and Wm. Schimpf, 40-horsepower Royal Tourists; W. T. Wintringham and B. W. Bergen, 20-horsepower Stevens-Duryeas; Dr. Clinton B. Parker and S. H. Burns, 24-horsepower Packards; Raymond Healy, 50-horsepower Zust; George A. Fisher, 28-horsepower National; V. F. Parker, 20-horsepower Locomobile; J. E. Bristol and Frederick Lampe, 40-horsepower Pierce-Arrows; E. W. Messereau, 24-horsepower Autocar; Dr. William E. Butler, 20-horsepower Frayer-Miller; Leffert Lefferts, 24-horsepower Pope-Toledo, and C. Jerome Edwards, 30-horsepower Cadillac.

Four Cars Disqualified.

Four cars that finished the run were disqualified: J. E. Bristol's Pierce-Arrow, Dr. Butler's Frayer-Miller, Raymond Healy's Zust and William T. Wintringham's Stevens-Duryea. The first three were disqualified because they failed to obey the rule of the contest which stipulated that all cars should be driven by their owners. The fourth, Mr. Wintringham's Stevens-Duryea, broke a spring which was not replaced. The disqualification of the Pierce Arrow was peculiarly unfortunate, for that car made the most economical run per passenger, as the summaries show, and also led the cars both going and coming. The owner could not drive, owing to an injured wrist. The silver loving-cup donated by Dr. C. B. Parker, winner of last year's economy contest, was captured by S. H. Burns, whose 24-horsepower Packard covered the entire

route without a hitch and without repairs of any kind. Second prize, a speed indicator, was won by Alfred Wilmarth, president of the Long Island Automobile Club, whose 40-horsepower Royal Tourist also came through with an absolutely clean record.

The route was from Brooklyn to Manhattan, through Jerome avenue to Yonkers, Peekskill and Fishkill to Poughkeepsie, returning by way of Fishkill, across the ferry to Newburgh, thence to Tuxedo and New York. Members not having a New Jersey license or not caring to pass through New Jersey, were allowed to return by the Fishkill-Peekskill-Yonkers route, as on the outward trip. The mileage of the two routes is about equal.

It was 11 o'clock before the last car had left Brooklyn for Poughkeepsie; Peekskill was scheduled for the luncheon stop. But between Yonkers and Peekskill a drenching down-pour of rain was encountered. Roads were converted into rivers and the hills were veritable rapids and cataracts, but the machines went through it and ten of them arrived safe in Poughkeepsie before 10 o'clock Saturday night.

Homeward Bound.

On Sunday morning the return trip was started. Along the west side of the Hudson the roads were found to be in a most discouraging state as the result of the rain of the previous day. Mud was plentiful and tenacious and the cars were tested severely. Suffern was the luncheon stop on the home run. At Fishkill Landing the ferry was taken across the river to Newburgh. Immediately after leaving the ferry the cars were forced to climb an awkward hill with a very steep grade, but all got up in good



A. WILMARTH IN 40-H.P. ROYAL TOURIST, WINNER SECOND.



J. E. BRISTOL IN 40-45-HORSEPOWER PIERCE ARROW.

shape. From Suffern the route led to Jersey City, where the ferry was taken to Brooklyn. Ten cars finished, and the records were as follows:

Summary of the Finish.

Pierce-Arrow, 40-45 horsepower; J. E. Bristol; 6 passengers; Brooklyn to Poughkeepsie; 8 gallons gasoline, \$2; Poughkeepsie to Brooklyn, 8 gallons gasoline, \$2; 1 pint oil, 8 cents; total, \$2.08; grand total, \$4.08; per capita cost, 81 3-5 cents. Disqualified because owner did not drive.

Packard, 24 horsepower; S. H. Burns; 5 passengers; Brooklyn to Poughkeepsie, 8 gallons gasoline, \$2; Poughkeepsie to Brooklyn, 8 gallons gasoline, \$2; 3 quarts oil, 45 cents; total, \$2.45; grand total,

\$4.45 per capita cost. \$5 cents. Winner of first prize offered by Dr. C. E. Parker.

Prayer-Miller 24 horsepower. Dr. Wm. Butler, 5 passengers. Brooklyn to Poughkeepsen 5 gallons gasoline. \$1.50. Work on motor. \$1.00. Total cost. \$2.50. Poughkeepsen to Brooklyn 4-5 gallons gasoline. \$1.25. 1 pint oil. 10 cents. 1 passenger and time \$1.00. Total \$4.75. Grand total \$4.45. 10 per capita cost. \$5 cents. Not repaired. Although charged in expense account. Disqualified because owner did not drive.

Kaye, Tourist 40 horsepower. Alfred Winchell, 5 passengers. Brooklyn to Poughkeepsen 11 gallons gasoline. \$1.65. Poughkeepsen to Brooklyn 11 gallons gasoline. \$1.65. 1 quart oil. 15 cents. Grand total \$3.30. 10 per capita cost. \$1.10. Winner second prize.

Autocrat 14 horsepower. E. W. Messersmith, 5 passengers. Brooklyn to Poughkeepsen 5 gallons gasoline. \$1.50. 1 passenger and time \$1.50.



DR. BUTLER IN 24-H.P. PRAYER-MILLER LEAVING SUFFERN.

oil. 25 cents. Total \$2.75. Poughkeepsen to Brooklyn 5-1-2 gallons gasoline. \$1.87. 1 quart oil. 15 cents. Grand total \$4.62. 10 per capita cost. \$1.54.

Packard-Arrow 20 horsepower. F. Lange, 5 passengers. Brooklyn to Poughkeepsen 11 gallons gasoline. \$1.65. repairs 50 cents. Total \$2.15. Poughkeepsen to Brooklyn 11 gallons gasoline. \$1.65. 1 quart oil. 15 cents. Total \$3.80. Grand total \$5.95. 10 per capita cost. \$1.98.

Laurel 14-20 horsepower. V. F. Parker, 2 passengers. Brooklyn to Poughkeepsen 5 gallons gasoline. \$1.50. Poughkeepsen to Brooklyn 10 gallons gasoline. \$2.50. 1-1-2 quarts oil. 25 cents. Total \$4.50. Grand total \$6.00. 10 per capita cost. \$2.00.

Packard 24 horsepower. Dr. C. E. Parker, 5 passengers. Brooklyn to Poughkeepsen 5 gallons gasoline. \$1.50. Poughkeepsen to Brooklyn 6 gallons gasoline. \$1.50. 7-8 quart oil. 15 cents. tire and repairs. \$1.75. Total \$4.75. Grand total \$6.25. 10 per capita cost. \$2.08. 10 per capita cost for fuel and lubricant. 51 cents. Not competing for prize.

Zoni 24 horsepower. Raymond Healy, 5 passengers. Brooklyn to Poughkeepsen 11 gallons gasoline. \$1.65. Poughkeepsen to Brooklyn 10 gallons gasoline. \$2.50. Grand total \$4.15. 10 per capita cost. \$1.38. Disqualified because owner did not drive.

Myers-Durfee 20 horsepower. William T. Witheringham, 4 passengers. Brooklyn to Poughkeepsen 6 gallons gasoline. \$1.50. Poughkeepsen to Brooklyn 6-1-2 gallons gasoline. \$1.62-1-2. 11-2 quarts oil. 25 cents. Total \$3.77. Grand total \$5.27. 10 per capita cost for fuel. 41 cents. Broken spring not repaired. Disqualified.

ILLUMINATED PARADE AT BUFFALO.

BUFFALO, N. Y., June 18—Buffalo's annual automobile parade under the auspices of the Automobile Club of Buffalo, June 14, was a success in every way. More than 200 automobiles were in line, all of them pretty well decorated. The start was made from the rooms of the Automobile Club at Main and Edward streets, and headed by President H. A. Meldrum, the parade passed down Main street and through several of the more prominent streets, finally ending at Athletic Park, where the prizes were awarded. Then the autists had a jolly good time at the expense of the management of the park.

Albert Poppenberg's Rambler was the winner of the first prize, a handsome silver loving cup, contributed by the park association. The car was decorated in white and was so arranged as to give the impression that the machine was drawn along by a swarm of butterflies. President Meldrum's car won second prize, a silver loving cup given by the Poppenberg Automobile Company, but Mr. Meldrum declined the prize, on the grounds of his official position, turning it over to Secretary D. H. Lewis, whose car came next. The Meldrum car presented an arbor hung with purple and white chrysanthemums, brilliantly lighted by purple and white electric lights. Among the passengers of the Meldrum car was Roy Knabenshue, the airship navigator. Special mention was awarded the cars of former President A. H. Knoll and George N. Dilfer.

AUTOMOBILE PARADE AT WERDEN, ILL.

WERDEN, ILL., June 18—Last Tuesday was another busy day in this city, which was celebrating its 20th anniversary with "Old Home Week" exercises on an extraordinary scale. In the procession were 116 automobiles, more than half of them newly bedecked. Dr. F. L. Murnover, Thomas Fayer, who won first prize, was decorated with black paper, black balloons, streamers with swags, which set a flag in the air and completely covered the car. The second prize winner, J. L. Perle's car, was adorned with a garland of flowers, the owner being a prominent member of the local I. O. O. F. The Elk club of party 3 was embellished all over the body of the car with massive bunches of flowers and purple streamers, connected the widespread streamers with the word "I. O. O. F." The car, which won third prize, was decorated with white banyan branches and a large gilt banner, a waving banner, the word "Elk". The prizes were two large silver cups, a silver loving cup, and a large silver stem. The parade was probably the largest automobile street display ever made in Germany.

BALTIMORE'S AUTO TRANSPORTATION

BALTIMORE, June 18—Alexander Brown & Sons, the well-known bankers of this city, are said to have acquired a controlling interest in the Automobile Towing Company, of which Richard Keating was formerly president. The name of the company has been changed to the Automobile Towing and Transportation Company. A Columbia electric phonograph, seating twelve persons, has been purchased and will be used in Druid Hill Park. Another vehicle of the same kind is expected this week.

AN AUTOMOBILE FOR AN OWL ROOST.

DEKALA, ILL., June 18—New uses are being found for the automobile every day, but who would think that the "whizzer" would be taken for an owl roost? That is just what happened to a Rambler machine that had been left under a big oak tree



FIVE OWLS WHO MADE A RAMBLER THEIR HEADQUARTERS.

on the campus of the Northern Illinois State Normal School near this place. The owner of the car is A. F. Rowley, a local photographer. When he approached his car and the situation was taken in by the surprised artist, he, for a moment, was at a loss to know just what to do, save that he made sure not to let the birds get away without leaving their picture.

GLIDDEN TOUR ARRANGEMENTS AND RULES

IN answer to a number of inquiries regarding accommodations on the third annual tour of the American Automobile Association (Glidden trophy contest), and inquiries regarding possible route discomforts, during the trip from Buffalo to Bretton Woods, on July 12-28, the officials have issued the following statement:

Arrangements have been made by the committee and superintendent by which provision has been made for a reservation of the entire transient accommodations in each place where the tour stops for the night. There is no place on the route where 400 tourists cannot be comfortably accommodated, and at several points as many as a thousand of the party can be adequately cared for. To accomplish this result it has been necessary to arrange for the erection of tents, portable houses, etc., at two points. In Canada arrangements are being made for the chartering of a large St. Lawrence river steamer, which will accompany the tour and will be used as a floating hotel.

Regarding possible congestion on the road and the danger of unpleasant dust conditions, members of the party which recently surveyed the road state that from Montreal to Bretton Woods there is practically no dust on the roads, on account of the prevailing heavy dews. On account of the necessity of making the day's runs as nearly equal as possible, the touring committee has decided that the first night's stop from Buffalo shall be at Auburn, and the second night's stop shall be at Utica. The most elaborate preparations are being made by the city of Auburn and the Auburn Automobile Club for the entertainment of the tourists, and at Utica there will also be special festivities on their account.

Pathfinding Car Will Be a Tour Feature.

Arrangements are now being made for a path-finding car which will precede the tour by about three days, and will thoroughly mark the entire route with arrows or other indicating signs, and will also carry a transportation agent, who will attend to the registration of the members of the party in each town. By these means the tourists, on their arrival at each night's stop, will find their rooms ready for them.

The committee will also institute a system of checking along the line, checkers being dropped by a patrol car at at least three points on each day's journey. These checkers will record the time that each car passes their checking points, the plan being to arrive at conclusions with regard to regularity of running throughout the tour. A second patrol car will follow the last tourist and will not only pick up the checkers left along the route, but will also act as a relief car, carrying word of possible breakdowns to the nearest towns and arranging for spare parts or tows if there should be any necessity of these.

The tender of a baggage wagon capable of carrying 2,500 pounds has been made by E. H. Cutler, president of the Knox Automobile Company, Springfield, Mass., and will undoubtedly be accepted by the committee. It is understood that other baggage wagons or trucks are to be offered, and the committee now feels that it will be in shape to handle the entire baggage of 400 or more tourists by automobile.

Arrangements have been made by which the customs problem (sometimes a perplexing one for tourists passing from the United States to Canada and back again) will be handled directly by the committee and entirely without expense to the members of the tour.

Official Entries Now Number Twelve.

An expected entry is that of Percy Pierce, who recently went through the Herkomer contest in a highly creditable manner. Owing to the postponement of the European Circuit, in which Mr. Pierce had entered his car, there is nothing to prevent his return to this country to defend the Glidden trophy, which he

won last year. In addition to the six entries for the Glidden tour published in the last issue of THE AUTOMOBILE, the following have been nominated, making a total of twelve to date:

No. 7.—Geo. Otis Draper, Hopedale, Mass. Saratoga to Bretton Woods. Will not contest for Glidden Trophy. Two in party.

No. 8.—Ezra E. Kirk, c. o. E. R. Thomas Motor Co., 1200 Niagara St., Buffalo, N. Y. Buffalo to Bretton Woods. Will contest for Glidden Trophy. Thomas car of 50 H.P. Five in party. Buffalo Automobile Club.

No. 9.—George M. Davis, c. o. E. R. Thomas Motor Co., 1200 Niagara Street, Buffalo, N. Y. Buffalo to Bretton Woods. Will contest for Glidden Trophy. Thomas car of 50 H.P. Five in party. Buffalo Automobile Club.

No. 10.—C. A. Coey, 1424 Michigan Ave., Chicago, Ill. Chicago to Bretton Woods. Will contest for Glidden Trophy. Thomas car of 50 H. P. Four in party. Chicago Automobile Club.

No. 11.—Albert A. Pope, c. o. Pope Manufacturing Co. Hartford, Conn. Buffalo to Bretton Woods. Will contest for Glidden Trophy. Pope-Toledo car of 35-40 H. P. Three in party. Automobile Club of America.

No. 12.—Albert L. Pope, c. o. Pope Manufacturing Co., Hartford, Conn. Buffalo to Bretton Woods. Will contest for Glidden Trophy. Pope-Hartford car of 25 H. P. Three in party. Automobile Club of Hartford.

Rules and Conditions Governing the Contest.

Concerning Entrants.

1. It will be assumed that every entrant is acquainted with these rules, and by entering for the tour agrees to abide by said rules, agrees to accept the official records, and authorizes the American Automobile Association to publish them in such manner as it shall determine.

2. Each entrant shall hold the American Automobile Association harmless and indemnify it against all loss or damage resulting directly or indirectly from or growing out of the operation, management or control of the car entered by him.

3. It is one of the conditions upon which entries of cars are accepted by the American Automobile Association, that said American Automobile Association shall not be responsible for any damage that may be done to any car, its passengers or contents during the tour, nor for the theft of any car or any of its accessories or contents, the same being at all times subsequent to such entry, and until the close of the tour, at the risk in all respects of persons entering same.

Qualifications.

4. Each entrant shall be a member of the American Automobile Association or of a club recognized by it.

Entries.

5. The time for receiving entries will expire on July 3, 1906, at 12 o'clock noon, at the office of A. B. Tucker, Superintendent, 31 West Forty-second street, New York City. Each entry for the 1906 event must be accompanied by the regular fee of \$50. Numbers for the tour will be issued in the order in which entries are received.

6. Each entrant shall give all details asked for in the entry blank.

7. The American Automobile Association reserves the right to refuse any entry.

Touring Conditions.

8. Each car entered shall be driven by the entrant, or by a driver or drivers nominated by him and approved by the committee; when the car is driven by other than the entrant, the latter shall ride in the car.

9. Cars must at all times during the tour have mufflers and mud guards and be equipped as per manufacturers' catalogue specifications, shall carry not less than four passengers of an average weight of 125 pounds, or their equivalent in ballast, and shall have touring car bodies with tonneau.

10. No replacements, replenishments, adjustments, repairs or inspection shall be made upon any car after the same shall have been registered at any night stop of the tour and before it shall have registered out on the next succeeding morning.

Number.

11. Each car shall have its official number prominently displayed on each side, or on front and rear.

12. No record of any previous performance, nor sign, or other indication of the maker's name, other than the nameplate, usually attached to the vehicle as sold to private owners, shall be displayed upon any car at any time during the progress of the tour.

Controls.

13. Cars shall be started each morning by officials of the tour between the hours of seven and ten o'clock A.M., but neither before or after the hours designated under penalty of disqualification, unless otherwise directed by the officials of the tour.

14. Each entrant shall, upon starting on each day's run, sign a statement submitted by an official of the tour fixing the hour of his departure from such control. Failure to comply will be sufficient ground for disqualification. Each day's tour shall be preceded by a pacemaker, designated by the committee, and any entrant who passes the pacemaker shall be disqualified. If the pacemaker breaks down or is compelled to travel at a rate of speed so low

as in the opinion of the committee to unduly impede the progress of the tour, his flag shall be transferred to the first car overtaking him, which car shall thereafter become pacemaker, subject to the same conditions.

Schedules.

15. The committee will publish a daily schedule fixing the exact time when each car may finish each day's run, without penalty. Said schedule shall not require any entrant to operate his car at a higher rate of speed than is permitted by law. Each car failing to finish at the time fixed by the schedule shall be penalized one point for each minute required to complete said day's run in excess of the schedule time fixed by the committee. And a penalty of two points for each minute any car may finish any day's run earlier than the time fixed by said schedule shall be imposed against said car. And no car shall be allowed to stop en route for the purpose of meeting said schedule with exactitude, under penalty of disqualification.

16. The car having the lowest penalization shall be awarded the Glidden Trophy.

17. Each car must register at each night stop immediately on arrival at the place of registration and must take its place immediately behind the cars in front until it can be properly registered. Contestants for the Glidden Trophy shall, however, be entitled to precedence in registration over non-contestants.

18. Immediately following the registration at each night stop, each car shall be delivered into the custody of the officials of the tour, to be by them held at owner's risk, and kept under the direct charge and supervision of such officials or their agents until the hour for starting on the following morning, and no car shall be available for tuning up, adjustments, filling with gasoline or water, or for any other purpose, until after it shall have registered as starting on the next day's run of the tour.

Special Hill Climb or Tour.

19. If, upon arrival at the end of the tour, the committee finds that a hill climbing or touring course is available, it may arrange a special contest for the participants of the tour, if in the opinion of the committee such a contest is advisable or necessary to determine to which entrant the Glidden or other trophy or trophies should be awarded. In awarding the Glidden Trophy, credit will be given each car for its performance as a touring car, since the test is for the purpose of determining the touring qualifications of each contesting car. The committee may also select one or more special runs during the tour in order to complete a total of 1,000 miles.

Road Regulations.

20. Entrants must conform to all laws and ordinances and the rules of the road, and any entrant violating any of the provisions of these rules or of other rules adopted by the committee, or who shall fail to show due consideration toward other participants in the tour, or other users of the highways, may be disqualified by the committee.

21. Any car whose owner or driver shall be arrested for a violation of the speed limit laws, or of any law or ordinance, may, in the discretion of the committee, be disqualified.

Disqualification.

22. Upon due notice being served by the committee on the person in charge of any car that the same has been disqualified, it shall cease to run in the contest, and the official numbers shall be removed, it shall not receive any award or certificate, but shall be mentioned in the record as having been disqualified. But no notice of disqualification shall be served upon the person in charge of any car until he shall have been first notified of the act which it is claimed should disqualify the car; and if the act be denied, action shall be postponed until the committee shall have given the owner or person in charge of such car a hearing, when a decision shall be rendered. Neither the person whose car shall have been so disqualified or any entrant of any car that may be disqualified shall have any claim of any kind or nature whatsoever against the American Automobile Association or any member or members of the committee or any official of the tour because of disqualification or the publication of the fact, or the failure to mention the performance of the car disqualified prior to its disqualification.

Protests.

23. Any participant in the tour desiring to enter a protest must first deposit the sum of \$10 with a member of the committee, which sum will be retained by the American Automobile Association if the protest is not sustained, and if the protest is sustained the protest fee shall be returned to the person making such deposit. All protests must be made in writing and will be considered by the committee at the earliest practicable moment and a decision rendered as soon as practicable thereafter.

24. (a) All protests as to entries must be made before the start.
(b) All protests as to unfair ruling, route, etc., must be made within twenty-four hours after the occurrence.

(c) All other protests shall be made during or immediately after the tour is concluded and before the award is made.

Powers of Committee.

25. The committee shall have power to disqualify any car for traveling at any speed which the committee may consider excessive under the conditions existing at the time, without reference to these rules.

26. The committee shall have power at all times to make such examinations of the cars entered and their contents as may be deemed advisable.

27. In the event of a dispute concerning the interpretation of the rules, the decision of the Touring Committee of the American Automobile Association shall be final.

28. Said Touring Committee reserves the right to alter or amend, suspend, or repeal these rules from time to time, down to and including the end of the tour and final award, as may in its judgment be deemed expedient.

Miscellaneous.

29. Rules 9, 10, 15, 16 and 18 shall not apply to non-contestants for the Glidden Trophy.

AUTO ADVICE OF THE OLD PARISIAN.

By GEORGE DUPUY.

These are the last words of the old Parisian automobile agent, directed to the son who is to succeed him in business:

"My son listen to this true aphorism: 'The customer is the enemy.'

"Remember that the English look at the transmission, the German at the motor and the American at the price. Then you must say to an Englishman, 'It is the most Robust of Gear Boxes,' to a German, 'It is the latest pattern in Motors,' to an American, 'It is the Highest Priced Car in the World.'

"If a buyer seems to hesitate, finally says that what he wants is a tonneau, while he is fighting over the price of a cab, be sure there is a woman in his business. Look out for her and when you have found the person, put your finest cab body on your worst chassis. That's a dead shot. And you get rid of a 'nightingale' you had in the garage for three years.

"Remember that the customer who talks much pays little.

"Remember that your best friend in the Automobile Industry is the Painter.

"Always make a client believe that he knows a lot in automobile mechanism. Tell him, for instance little things like these: 'You who are a connoisseur,' or 'As you know the business just as well as I do, I shall not insist upon the fact, etc.'

"Also vary the epithets, 'luxurious,' 'chic,' 'original,' 'distinguished.' They are words to be used when a man comes to you in company with his sweetheart. But you might say sometimes, 'comfortable,' when the customer is in the garage with his wife.

"Be gentle and patient in all circumstances. For instance if a blessed fool comes and asks you if that 10-horsepower can go 60 miles an hour, say, 'Well, the weather should be particularly favorable, you know,' or 'I hardly think so, with the body she has on.'

"Be cold with society people, spinner of phrases with the timid; severe with the undecided, jolly with the selfmade man, smiling with the 'ripe lady,' disdainful with the incredulous, indifferent with the skin-flint. Always keep a high and well-maintained glance, don't leave your adversary's eyes when you affirm something.

"Have always fine shoes. In the garages, the people that reflect have the mania of always looking at your feet.

"Insist on the 'economy in consumption.' The argument is irresistible above all with wealthy people. They spend willingly 10,000 francs to get 50 cents. This is special to Motoring."

HIGHWAYMEN ATTACK CAR IN JERSEY.

TRENTON, N. J., June 18.—An attempt by road agents to hold up the 48-horsepower Packard belonging to the Hon. Cornelius Turford, between Lawrenceville and Princeton, has provided a sensation in automobile circles here. The occupants of the machine, Barker Gummere, treasurer of the Trenton Trust Company, and Charles E. Gummere, solicitor of the Pennsylvania Railroad, had been to Princeton attending class day exercises at the university, and were returning home. When they reached a point about a mile above Lawrenceville, a man seated in a wagon alongside the road called out to them to slacken speed if they didn't want to be killed. About 100 yards further on a large man blocked the way and ordered them to stop, and the headlights showed a rope stretched across the highway, held by a man on either side. The chauffeur tried to avoid striking the man in the road, but the machine crashed against him with full force. The men at the rope dropped it and fled, and the party in the car proceeded on to Trenton. The police have been unable to obtain any clues up to date.

TOURING IN THE WHITE MOUNTAINS

By ROBERT BRUCE.

WITHIN the past two or three years the White Mountains of New Hampshire have become fairly well known to thousands of American automobilists. Many others who have not had the opportunity to personally explore this section, and of thus gaining first-hand knowledge of the excellent tours and first-class facilities to be found there, have at least had their imaginations stirred as they have read of the various successful trips already made from practically every direction. The pilgrimage to and from these Granite Hills really began early in 1904, and it has steadily grown up to this writing.

Some heavy grades are encountered, it is true, especially when coming into Crawford Notch from the south or east, and coming into Bethlehem from the south or west. Yet these grades are no steeper than numbers of climbs which are taken as a matter of course in Pennsylvania or Wisconsin, to say nothing of those in Colorado, Utah, Wyoming or California. Many of the roads along the valleys and around the bases of the mountains are nearly as level as those of the Western prairies.

It must be admitted that many touring cars have been hauled through Crawford Notch, up Bethlehem Hill, etc., as well as "assisted" at various other places. But in most cases this has been caused either by some minor injury, which has rendered the car incapable for the time being of giving its best service, or else made necessary by the slippery condition of mountain roads following the frequent heavy rains. The percentage of "assisted" cars will always be found to be very small as compared with the number of those that pass easily and almost unnoticed over even the worst grades in the most unfavorable weather.

A Notable Absence of Urban Annoyances.

There are many compensations—most valued of them all, of course, the entire absence of city conditions, with its dense crowds and heavy traffic. While within the last two years the New Hampshire legislature has passed its first laws regulating speed and prescribing other conditions, it is safe to say that there will never be a campaign of persecution, such as has so long been waged at certain places in New Jersey and by a few towns on Long Island. The revenue from tourist travel up there is too great to be lessened

or endangered in any such way by the thrifty people in the small towns and in the country. Openly reckless tourists may be "picked up" now and then, but on the whole the welcome to the White Mountains will be friendly and lasting.

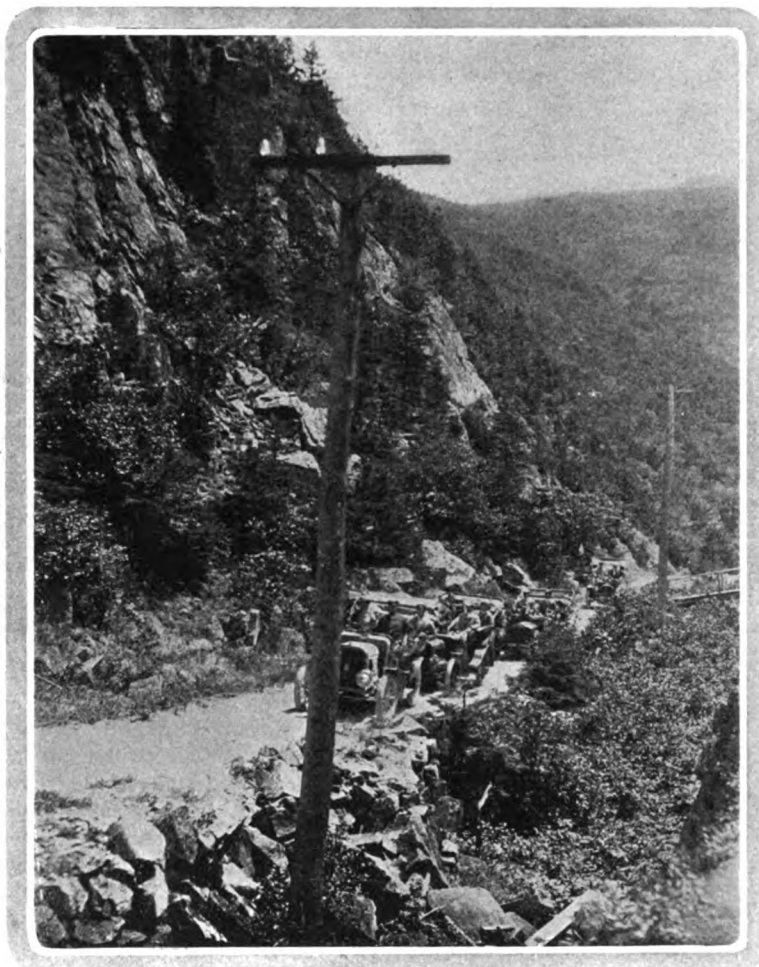
Fresh Water Supply Ever Prevalent.

Water is nearly everywhere as abundant as air. The stranger who tours in the mountain districts with a water-cooled motor car is surprised to note the number of springs, streams and roadside pools. He can scarcely travel a mile on any road without crossing some bridged and babbling

brook, or finding a pure, cold spring bubbling up at the wayside. In the height of the season, of course, supplies will be found at nearly every hotel on the main-traveled routes. However, the few garages close when the great summer hotels do and other fashionable colonies go. Yet the merchants in the towns and villages, as well as most of the commercial hotels, have learned the advantage of catering to the transient autoist, and there will be no trouble in finding either a place to stay or the wherewith to supply one's machine with fuel as late as a mountain tour is in any way practicable.

A Supply of Spare Machine Parts Should Be Carried.

It is advisable, however, to take every possible care in planning a tour. One should prepare himself and equip his machine for a White Mountain trip exactly as he would for a tour in any other section of hilly country—looking particularly, of course, after the strength and certain action of the braking mechanism. Common sense driving will take care of the rest, even to getting along with the few frightened horses of the country districts. Everywhere the automobilist goes he will be kindly received by the hotel men and the townspeople alike, and it is probable that many will be the expressions of regret when the time comes to leave for home. The worst trouble likely to be experienced is the inadequacy of facilities for the proper repair of cars and the replacement of broken parts. The latter must usually be ordered from the larger cities, usually by telephone, the shipment being made in a night from Boston or New York to practically all New Hampshire points. Extra small parts should be carried in order to avoid delays.



IN THE HEART OF CRAWFORD NOTCH, WHITE MOUNTAINS.

Various Routes by Which Mountains Can Be Reached.

The steady increase of visitors to the mountains has brought forward many ways of reaching them from New York, Boston, Canada and other sections; but the pleasantest as well as the most novel way is, of course, by automobile. One desiring to make this trip from New York can do it in several ways. He may either tour to Boston by any one of the several routes, thence to the mountains by the Merrimack river valley or by the Coast Line to Portsmouth. Or he may go up the Hudson river to Poughkeepsie or Hudson, N. Y., and pass through Central Massachusetts to the Connecticut river valley. Or he may follow the road from New York to New Haven, Meriden, Hartford and Springfield, thence up the Connecticut river.

The distance from Boston by the route generally preferred by automobile tourists, viz., via Lynn, Salem, Newburyport, Mass., and Portsmouth, N. H., is only about 181 miles, and even if continued to include a few points or two not on the original program, the mileage will not exceed from 225 to 240. Such a trip ought to have at least two days, and if a first trip it would be wiser to extend it over three or four and see more on the way.

Dover is a short run of twelve miles inland from Portsmouth. From this point all roads lead direct into the mountains through Rochester, Ossipee and North Conway to Crawford Notch, Bretton Woods and Fabyan's; thence, in case the trip be prolonged, to Franconia Notch and the Profile House, with a considerable number of interesting towns and resorts between. The Maine Steamship Company's boats run direct from New York to Portland, from whence the White Mountains are about a hundred miles distant either via Sebago Lake or via Cornish, Me. This arrangement would require not more than one hundred miles of road traveling between New York City and the base of Mount Washington, while the car can be run on and off the boat much easier than it could be prepared for rail shipment.

Cost of Trip Largely a Matter of Taste.

Within reasonable limits, of course, the expense of a trip in the White Mountains are very nearly what one wishes to make them. If you are bent upon doing the thing "royally," an outside figure of \$20 or \$25 per day for each person can easily be spent. Or you can put up at first-class places and include reasonable incidentals for \$6 or \$7 per day each. Many do live on less than this and manage probably to have as good a time as do the rest. Fashionable people flock here in considerable numbers, especially in July and August, but as a rule those of real wealth carry things to less conspicuous extremes than the really semi-fashionable element, who, fearing to aim too low, often aim too high.

The hotel charges, whether "high" or "low" (both relative rather than exact terms) are only the basic items of expense with most people in the mountains. Carriage drives, horse-back rides, guides and other accessories are what cost the most. Here is where the autoist, with even a fair knowledge of the roads, may find his car not only a means of independence but also a source of economical traveling.

With such knowledge and such equipment, one needs neither public conveyances nor guides. Saving time, as compared with waiting for trains and making frequently inconvenient connections, he can usually plan an out-and-home trip in one day. This allows him, if desired, to make one place his headquarters during any length of stay he may choose to make; and yet the entire section is within easy reach.

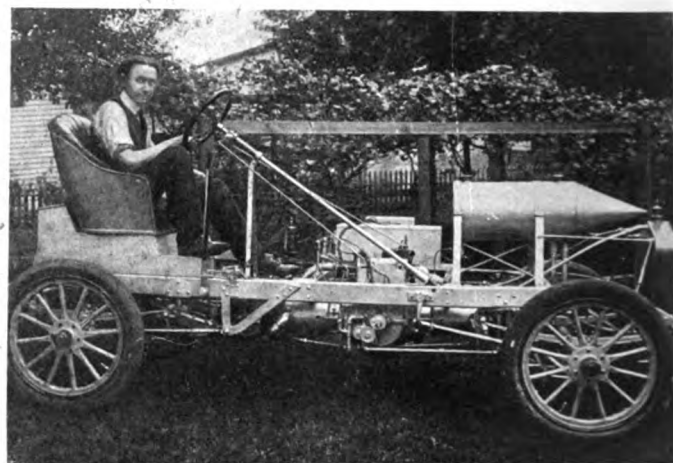
At an expense representing perhaps nothing more than a few gallons of gasoline and a mid-day lunch for the party, he can make the slow and cut-and-dried one-day coaching tours, for which \$10 fare is charged each person, seem like a seventeenth century junketing trip. The fare for the railroad trip up Mount Washington and return is \$4, and the greater part of a day is required for it. In the same time a motor car

could make the round between almost any two points in the central mountain district. If the future shall open the carriage road up Mount Washington to automobiles on equal terms with carriages, it will be entirely possible to take the road around from Bretton Woods, Fabyan's or Crawford House to Glen Cottage (on the opposite side of the mountain), make the ascent and return to the point of starting in time competition with the direct cog railway.

Taking all in all, the advantages and accommodations generally had in the White Mountains are so much superior to those of the average district equally distant from the big cities that no one who measures cost by quality of service need complain of the expense. There is nothing "cheap and shoddy" about the accommodations in this section, and the charges are invariably proportioned in just measure to the service rendered. That is the region of all-around satisfaction for the auto tourist all who have toured that way seem to agree.

A NEW MICHIGAN RACING CAR.

A racing automobile of 60-70 horsepower has been completed by Dr. Freeberg, of Jackson, Mich., who has been an enthusiastic automobilist from the beginning of the sport, and who has ideas of his own as to how a fast car should be built. The car was built quietly, even secretly, in a private machine



DR. H. W. FREEBERG IN HIS 65-75-HORSEPOWER RACING CAR

shop in Jackson, the work having been done by one of the oldest machinists in the country under Dr. Freeberg's supervision. The machine will be known as *White Flyer No. 1*.

A horizontal water-cooled motor is used, having four opposed cylinders and carrying the flywheel at the middle of the crankshaft. Transmission is from a sprocket beside the flywheel by chain to a planetary gear on a countershaft just behind the engine, and from the gear to the rear axle by chain. A ratio of 12-3 to 1 is given by the sprockets fitted, and the road wheels are 30 inches in diameter. Countershaft and road wheels are geared "level" and revolve at the same angular speed. A second set of road wheels, 34 inches in diameter, can be used, giving a higher road speed for a given engine speed than the smaller wheels. The weight of the car is 1,850 pounds, and the load is equally distributed between the front and rear wheels. The general appearance of the machine is clearly shown by the accompanying halftone engraving.

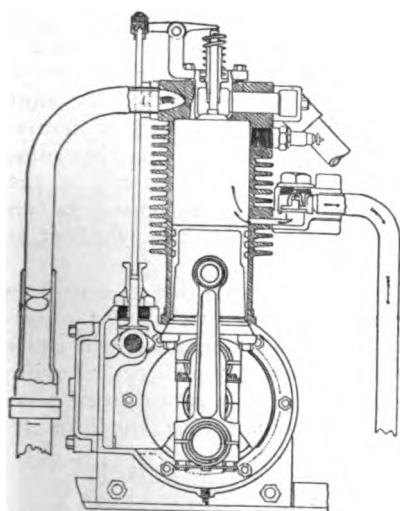
The doctor expects to do a good deal of racing with his new car during the coming season, and will shortly give the car an official test run over a mile course.

Switzerland is considering the advisability of imposing practically prohibitive entry fees on automobiles of more than 12 horsepower in retaliation for the so-called international boycott instituted in December last. The boycott is very half-hearted.

AIR-COOLING SYSTEMS FOR MOTORS

AIR-COOLING, as applied to motors of sufficient power for use in automobiles, is a distinctly American development, and has been brought to a high state of efficiency in this country, though in other automobile building countries air-cooling has not been given serious attention for automobile work, except in a few isolated cases. The air-cooled motor originated in France, where it was early used for bicycles and tricycles—vehicles now classified under the general heading of motorcycles—and it was exceedingly popular. When it came to automobile motors, however, water cooling was adopted in most cases, even for the smallest cars, and invariably for larger machines. For motorcycles the air-cooled motor is still the standard, though

occasionally water cooling is employed. In the United States, however, the air-cooled motor appealed strongly to manufacturers and the work of overcoming the difficulties of building large air-cooled motors has been carried out along various lines and with very satisfactory results. Cars are now built with 40-horsepower air-cooled motors with four vertical cylinders; this means 10 horsepower to a cylinder, which would have been considered an impossibility a few years ago.



CYLINDER WITH CAST FLANGES.

Note valves in head, auxiliary exhaust and large piping.

Radiation and Convection.

Before discussing the construction of the various types of air-cooled cylinders, it may be well to insert a word of explanation with regard to the terms radiation and convection. While radiation plays an important part in the cooling process, radiation alone would not prevent overheating. To radiate, according to the actual meaning of the word, is to "send out in straight lines." The heat from the cylinder goes out in straight lines and if there happens to be any heat conducting substance in the path of those lines, the radiated heat passes into it. The heat from the inner walls of the cylinder is radiated through the iron to the surfaces of the flanges on the outside, and thus far radiation is indispensable; but when it comes to removing the heat from the flanges, radiation is a very slow and inefficient process, and air an unwilling absorbent of heat. Radiation is entirely independent of air currents, for heat will radiate in its undeviating straight lines regardless of the strongest blast.

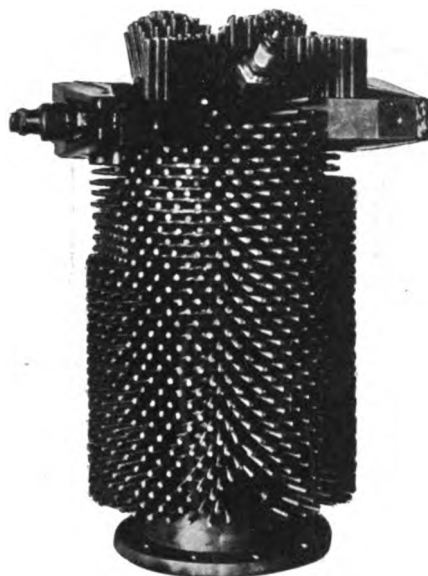
Radiation, then, being a comparatively feeble process, how are we to get rid of the heat that accumulates on the flanges and, if not removed, will overheat and stop the motor? By convection—conveying or carrying away. A draft of air is directed against the cylinder and the molecules of air, coming in direct contact with the hot surface, absorb heat and carry it away. It is like wiping water off a wet surface with a cloth, rather than letting it dry up by evaporation. The process of convection is entirely distinct from radiation though the two are commonly confused.

It will now be seen that the flanges and other area-increasing devices on air-cooled cylinders are used as sur-

faces on which the heat from within the cylinder can be spread out to be the more readily picked up by the passing air currents.

Methods of Increasing Cooling Surface.

The first successful air-cooled cylinders were made with a series of integral flanges, ribs or rings extending around the exterior of the cylinder and head, placed quite close together and made as thin as possible. This arrangement is still the most commonly used and is adopted by many successful manufacturers of air-cooled motors. The flanges are usually cast integral with the cylinder, and in some cases are machined but more common-

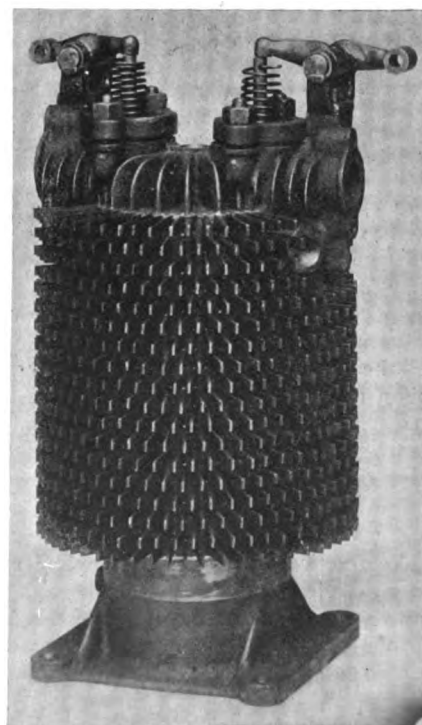


THREADED PIN COOLING SYSTEM.

ly left as they come from the foundry except for a little smoothing up. Integral cooling flanges are not, however, used on all successful air-cooled automobile motors; there are many types of cylinders in which pins, pieces of corrugated metal, tubes, spirals and other devices are inserted.

In one type the cylinder is a plain casting, rather heavy; holes are drilled from the outside about 3-16 inch deep—care being taken not to break through the inner wall—and the holes are tapped. Into the tapped holes are screwed steel pins, each pin having a deep thread or groove cut along its entire length to increase the superficial area. The pins are set close together and give the cylinder a very characteristic porcupine-like appearance.

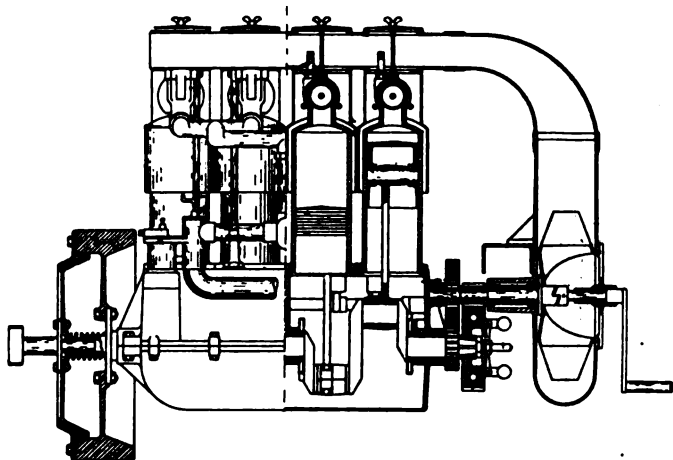
In another type tubes are screwed into the cylinder casting, slots being cut in the tube to permit free circulation of air. Another cylinder has a multitude of steel or



INSERTED METAL COMBS.

brass spirals screwed in, and looks as if spiral springs were projecting from it.

Copper flanges, plain and corrugated, have been brazed to both cast-iron and steel cylinders. It is rather difficult to use copper in this way because of its wide range of expansion and contraction under the influence of alternate heating and cooling. To be effective, the copper must be in actual contact with the cylinder—even the formation of a film of oxide between the adjoining surfaces reduces the transference of heat.



JACKETED CYLINDERS AND FORCED DRAFT.

In still another type grooves are cut in the outer wall of the cylinder and copper fins, usually having comb-like teeth, are inserted and the metal along the grooves is then hammered or "peined" down so as to forced against the inserts. A very secure job is thus made. A rather curious method of inserting copper fins consists of drilling holes lengthwise in the cylinder wall from top to bottom and then slotting the outer wall so as to open the holes. Strips of copper the length of the grooves are doubled lengthwise, the bend being made of the same cross section as the slotted holes in the cylinder. The strips are then forced into the grooves, being slid in endwise, and are retained only by their close fit in the grooves. A casing surrounds the cylinders, four in number, and a forced draft is maintained by a fan-blower.

A rather difficult piece of work consists of placing copper flanges or toothed pieces in the mold in which the cylinder is cast, the molten iron surrounding and gripping the bases of the copper pieces.

An extremely novel and interesting surface-increasing device has been made as follows: Copper wire of square section was wound over a form as if to make a long spiral spring, except that the form was triangular instead of round, the triangle having a short base and two long sides. Inside the spring-like coil thus made was run a flat copper ribbon, and the whole was wound around the cylinder, the copper ribbon pressing the short base of the triangular coil closely against the casting. Then the cylinder was placed in an electro-plating bath and the coils united to the casting by a heavy coating of copper.

Other Methods of Air Cooling.

The practice of enclosing the cylinders in jackets and blowing air under slight pressure through the jackets, has met with success. When this is done the flanges and other projections on the cylinder are not so essential, and are present only in a rudimentary form, in some cases. The fan or blower used with such a motor is of course depended on wholly to produce the air current, and natural draft is not considered, nor can it be, owing to the cylinders being inclosed.

In all air-cooled engines the valves are arranged to give the greatest possible freedom to the movements of the gases, especially the exhaust. Valves usually open directly through the cylinder heads and are as large as the diameter of the head will permit. The importance of getting rid of the intensely hot exhaust gas as speedily as possible has led one maker to adopt an auxiliary exhaust port which is opened, or rather uncovered, by the piston as it moves over the lowest part of its stroke; a check valve placed in the passage prevents the taking in of dead gas on the suction stroke.

While small automobile engines developing about three horsepower per cylinder are frequently run without fans, depending upon natural draft for cooling, the majority of air-cooled motors, like their water-cooled brothers, make use of fans, sometimes placed in front and blowing back on the cylinders, and sometimes on top, blowing down on the cylinder heads. It is interesting to note that with the fan-in-front arrangement the rear cylinder of a well-designed four-cylinder motor does not suffer from overheating any more than do the others—in fact, sometimes the front cylinder, nearest the fan, will be the hottest. The reason for this is that the greatest volume of air is thrown out near the ends of the fan blades and the least by the nearly dead central part. The heavy outer air currents converge as they pass back, passing the front cylinders and striking directly on the rear ones. With a well designed fan arrangement the air draft can be distributed so as to keep all the cylinders at about the same temperature.

The lubrication of an air-cooled motor is, of course, a very important matter—even more so than that of a water-cooled motor, because the absence of lubrication will cause damage and overheating more quickly in the air-cooled cylinder. Therefore the lubrication system is always very carefully arranged and should be kept in perfect condition by



WIRE COILS RETAINED BY COPPER PLATING.

the operator of the car. Usually a splash system is supplemented by a force feed oiler of some good make. Jump spark ignition is the rule, the necessity for keeping the combustion chamber free of projections that might hold heat sufficiently to cause pre-ignition doubtless putting make-and-break ignition out of the question.

CATECHISM OF THE GASOLINE AUTOMOBILE*—III

By FORREST R. JONES, M.E.

Q.—Describe a primary electric battery, such as is used for ignition on a gasoline automobile.

A.—The primary battery is a group of cells electrically connected together as with wires. The dry cell (or semi-dry cell) is almost invariably used. Each cell is composed of three elements; usually carbon, zinc and a liquid electrolyte.

In the ordinary form of dry cell sheet zinc is made into a cylindrical vessel closed at the bottom and open at the top. A solid stick of carbon is placed inside and the remainder of the space is filled with pulverized carbon (coke). This is moistened with the liquid, generally a solution of sal ammoniac. The top is closed with pitch to prevent leakage and evaporation. Each cell is placed in a cardboard box, which protects the zincs of adjacent cells from coming into contact with each other when connected together to form a battery. A binding post for holding the wire connections is attached to the zinc and another to the carbon. Carbon is the positive element and zinc the negative.

In any cell or battery

+ (plus sign) indicates the **positive** terminal (binding post and nut).

— (minus sign) indicates the **negative** terminal (binding post and nut).

Q.—What is **series** battery connection?

A.—One in which each carbon is electrically connected to the zinc of another cell, except the carbon of one end cell and the zinc of the other end cell. The two binding posts left free are the battery terminals.

Q.—What is a **multiple** or **parallel** battery connection?

A.—One in which all the carbons are electrically connected together and all the zincs connected in the same manner.

Q.—What is a volt?

A.—The unit of electromotive force (electrical pressure, potential). The volt is analogous to pounds per square inch of liquid or gas pressure.

Q.—What is an ampere?

A.—The unit of current volume; a certain rate of flow of electricity (electrical current). It corresponds to gallons per minute, etc., for the flow of a liquid.

Q.—How much is the voltage of a carbon-zinc dry cell?

A.—About 1.4 volts per cell when operating for ignition purposes. It is slightly higher than this in a good cell that is not in use. The voltage continues to drop with the use of the cell.

Q.—What is an electric storage cell (accumulate-cell, secondary cell)?

A.—One which requires electric energy to be supplied to it before it will act to deliver current. It consists of two elements immersed in a liquid. The more common form has perforated lead plates or grids whose openings are filled with compounds of lead. The plates are immersed in dilute sulphuric acid. When electric current is forced through the cell, it changes the chemical composition of the lead compounds which are thus charged so as to give out electric energy to an amount somewhat less than that received by the cell.

Q.—What is a **ground** connection?

A.—As used in automobile practice the term means any electrical connection between a wire or part of the electrical apparatus and the framing of the machine. A "ground" may be made either purposely or accidentally.

Q.—What is a short circuit in an electrical wiring system?

A.—It is an undesirable path for the electric current which allows it to flow without passing through all the

apparatus which should be included in the circuit. A short circuit generally has less electrical resistance than the proper circuit, although this is not necessarily true.

Q.—What is an induction coil?

A.—An electrical apparatus which receives a low pressure (voltage) current from a battery or other source and transforms it into a current of enormously higher pressure (voltage) and correspondingly smaller volume (amperage).

Q.—What is the primary or low tension winding of the induction coil?

A.—It is an insulated copper wire of a comparatively large cross section which is wound on a spool around a bundle or sheaf of small, straight, commercially pure soft iron wire, called the core. The copper wire carries the low pressure current from the battery or other source.

Q.—What is the secondary or high tension winding of the induction coil?

A.—It is a very thin insulated copper wire of great length wound in many turns around outside of the primary coil on the same spool. It carries the induced current of high voltage which is used to produce an electric jump-spark in the combustion chamber of the gasoline engine.

Q.—What is the vibrator (trembler, interrupter) of an induction coil?

A.—It is a flat strip of thin spring metal held firmly at one end and with a piece of soft iron attached to the free end. When an electric current is sent through the induction coil the trembler is set into vibration and breaks and makes the electric current during its double vibration.

Q.—What is the condenser of an induction coil?

A.—A number of sheets of tin foil laid together with thin oiled or varnished paper or other non-electric substance between them. The ends of alternate sheets of the foil are connected together electrically. Two groups of interlying sheets are thus formed. As used in connection with the induction coil, it becomes charged with electricity, when the current is interrupted by the trembler, and when the latter again closes, the condenser quickly gives out the electrical energy just stored in it.

Q.—What is a timer for jump-spark ignition?

A.—The apparatus which closes the primary electric circuit (battery circuit) to produce a spark at the igniter (spark plug) at the proper instant for igniting a combustible charge in the engine. It ordinarily consists of an outer casing of insulating material (hard rubber or wood fiber) with a hollow cylindrical surface in which metallic points are set. A central rotating part (rotor) driven by the engine brings a metal arm or similar device into contact with the stationary metal in the casing, thus completing the electric circuit through the timer. While the form varies greatly in different designs, the function is always the same.

Q.—How often should the timer close the primary circuit for each cylinder of a four-stroke cycle engine?

A.—Once every two revolutions of the main shaft for each cylinder (every four strokes of each piston).

Q.—At what speed should a timer with a single rotating contact arm or point rotate in a four-stroke cycle engine?

A.—Half as fast as the main shaft (crankshaft). This is the same speed as that of the camshaft.

Q.—Where is the timer attached to the four-cycle engine?

A.—Very frequently to the camshaft (half speed shaft, half time shaft). A shaft or chain drive especially for the timer is also frequently used in order to bring it in an accessible position, or where dirt and grit are not apt to accumulate on it, as well as for other reasons.

Q.—Should the timer always close the primary circuit when the piston is passing through the same position in its travel, whether the engine is rotating rapidly or slowly?

A.—No. The primary circuit should be closed earlier in the cycle when the engine is turning over rapidly than when it is running slowly.

Q.—Why should the timer be closed earlier at high rotative speed of the engine than at slow?

A.—For two reasons:

First.—There is an appreciable time between the instant at which the timer closes the primary circuit and the occurrence of the spark between the ignition points in the combustion chamber. This time interval is constant whatever the speed of the engine. It may be called the lag of the spark. In order, therefore, to have the spark occur at a given position of the piston the timer must close the primary circuit earlier in the cycle when the engine is running rapidly than when turning over slowly.

Second.—An appreciable time is also required for the inflammation of the charge in the combustion chamber, and the rapidity of inflammation after ignition by the jump spark varies with the intensity of compression in the charge. When the charge is small and the compression low, more time is required for inflammation than with a full charge and correspondingly high compression.

For these reasons the timer should close the primary circuit earlier in the cycle when the engine is running rapidly than when it is turning over slowly; and also when the charge is small (by throttling) as compared with the full charge allowed to enter by an open throttle.

Q.—What provision is made for adjusting the timer with regard to the instant of closing the circuit?

A.—The part ordinarily referred to as the stationary part (as distinguished from the rotor) can be rotated part of a revolution (sometimes as much as 90 degrees) around the axis of the rotor. This is done by the connecting parts (rods or wires) which lead to a spark control within reach of the driver.

Q.—How much will a rotation of 90 degrees of the stationary part of the timer change the time of closing the primary (coil) circuit in relation to the rotation of the crankshaft in a four-stroke cycle engine?

A.—One stroke of the piston. This corresponds to one-half revolution of the crankshaft in the ordinary type of engine.

Q.—What is a late spark (late ignition)?

A.—One that comes late in the cycle of the engine. The spark coming after the piston has gone some distance on the impulse stroke is a late spark. It may come much earlier than this, however, when the engine rotates rapidly, since the speed of the engine enters as a factor in determining what is a late spark.

Q.—What is an early spark (early ignition)?

A.—One that occurs earlier in the cycle than the late spark. When the engine is running at considerable speed an early spark comes before the completion of the compression stroke. The timer may be adjusted so that the primary circuit is closed when the piston has completed less than half its compression stroke, but under this condition a spark will not pass when the speed is very high until the compression stroke has been nearly completed.

Q.—What is meant by advancing the spark?

A.—Moving the timer so that the primary circuit is closed earlier. This is the general acceptance of the term, but, as may be seen from the foregoing, does not always mean that the spark always occurs earlier in the cycle.

Q.—Describe a jump spark igniter (spark plug), naming the materials and their electric properties.

A.—The ordinary type consists of three essential parts, which are an outer casing of metal or alloy, a tube of insulating material such as porcelain or mica which fits into the

outer casing, and a central metal rod or wire which fits into the hole through the non-electric tube (insulator). A small wire is rigidly attached to either the casing or central wire and its end brought to within a short distance from the other metal part. The space between the point of the wire and the other metal part is called the spark gap or air gap. It should be about 1-32 inch wide. The outer metal is generally threaded to screw into the cylinder casting of the engine. The spark gap in the combustion chamber when the spark plug is in place.

Q.—Does the air gap in the spark plug offer the same resistance to the flow of electric current in the open air as in the combustion chamber when the charge is compressed?

A.—No. The resistance to the jump spark is greater in the compressed mixture than in open air.

Q.—If the electrical pressure of the secondary coil is only high enough to force a spark across the gap of the spark plug at atmospheric pressure, will any spark be produced when the plug is in the combustion chamber and the charge compressed?

A.—No. It is necessary to have enough electromotive force to produce a spark about 1-4 inch long in the open air in order to be certain of securing one inside the combustion chamber at the proper time.

Q.—How is the automobile wired in the jump spark ignition system for a single-cylinder engine using a battery for the source of electrical energy?

A.—One terminal of the battery is connected by a wire to the frame of the automobile (a bare wire will answer). The other battery terminal is connected to one end of the primary winding of the induction coil. The other end of the primary winding is connected to the insulated stationary metal portion of the timer. The rotor of the timer is electrically connected to the frame of the machine either by its metallic contact with the shaft which carries it, or by a wire when the rotor is made of insulating material and does not connect electrically with its shaft.

The path of the electric current is then from the battery to the primary winding of the induction coil through which it passes; then to the timer and through it during the time contact is made between the timer contact points; then to the frame of the machine and through it to the wire which connects to the "grounded" terminal of the battery.

A switch for opening the circuit is placed somewhere in the primary circuit, sometimes by cutting into the wire between the battery and the induction coil. In other cases the switch is placed on the induction coil box, so that there is no break in the wiring at any place outside of the apparatus.

A wire leads out from the secondary or high tension winding of the induction coil to the spark plug. This completes the wiring.

The high tension current passes along the wire from the induction coil to the insulated central wire of the spark plug, jumps across the spark gap to the outer bushing, which connects to the metal of the engine. Then down to the timer through the engine metal and back to the induction coil through the wire between the timer and coil already mentioned, which wire also carries the battery current. In most cases one end of the primary and one end of the secondary wire are both connected to the binding post of the induction coil to which the wire leading to the timer is connected. When this is not the case, an additional wire must be used to connect the body of the engine to a binding post at the remaining end of the secondary winding.

An automobile parade will be a prominent feature of the annual horse show at Oak Park, a suburb of Chicago, early in September next. John Farson, president of the Chicago Automobile Club, is president of the organization that is promoting the horse show.

WHERE AN AIR-COOLED CAR IS BUILT

EVERY modern manufacturing plant worthy of the name is divided and subdivided into departments, each department being responsible for a certain class of work and nothing else. The old-fashioned idea of training each man or set of men to do any job in the shop has given way to the modern method of specializing. Each man is a specialist in his line,



GRINDING A CRANKSHAFT

and he is kept everlastingly at the same class of work until he is far more skilled in it than the all-round man could hope to be, and is more valuable to his employers and to himself than he would be otherwise. The departments are independent of each other to a great extent, but nevertheless all work in harmony. The work turned out from one department must exactly fit into the place prepared for it by another department, for there is no such thing as fitting and trimming to get things to go together. Each part is made to a fixed, unvarying set of dimensions, and these are so closely adhered to that any part of any car will fit just as well in the corresponding place in any other car of the same model; this is what is known as the interchangeable system of manufacturing.

Automobile manufacturing establishments are notably up

to date in specialization, production of interchangeable parts, the use of automatic machinery, and so on. The plant of the H. H. Franklin Manufacturing Company, of Syracuse, N. Y., is an excellent example of its kind, and a good idea of some of its departments may be gained from the accompanying engravings. It is interesting to note that the first Franklin cars, thirteen in number (evidently a lucky number in this case), were turned out during the season of 1901-1902 by a force of ten men. The first of these cars is still in active service in New York City, and could never be taken for anything but a Franklin. During the next three seasons the number of cars turned out increased rapidly; the second season 179 cars were built; the third, 659; the fourth, 1,102; while the company estimates the output for the season 1905-1906 at from 1,500 to 2,000 cars. The factory force has increased from ten men to 1,220 men and the floor space of the factory from 3,750 square feet to 150,000 square feet, and even this is now none too large, and further extensions, already provided for, are being considered.

Power for driving the scores of machines in the factory is provided by two Sterling water-tube boilers of 175 horsepower capacity each, supplying steam to a 200-horsepower straight-line engine direct connected to a Westinghouse generator of 160 kilowatts capacity, the current from which is used for power purposes in the factory as well as for the 1,200 arc and incandescent lamps, with the aid of which night is sometimes turned into day during the busy season. Additional power can be obtained at any time from the mains of the local electric light company. Fire protection is given a great deal of attention. In the power house is a Knowles pump having a capacity of a thousand gallons a minute. In the factory staircases are separated from the work-rooms,

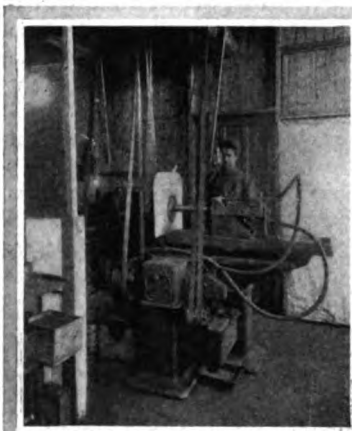


THE BIG MACHINE SHOP IN THE FACTORY OF THE H. H. FRANKLIN MFG. CO., SYRACUSE, N. Y.



THE PATTERN ROOM KEEPS A LARGE FORCE BUSY

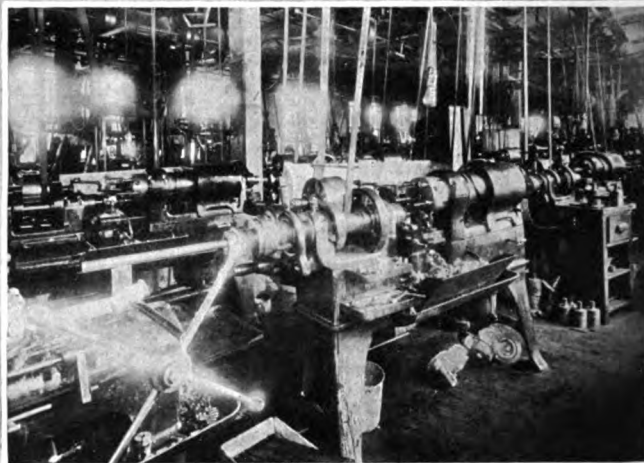
and entrance is gained by means of large iron-sheathed sliding doors. Hand grenades and other fire-fighting apparatus is provided everywhere, and a private fire brigade, made up of men in the factory, is given several drills each week and kept in constant training for any emergency that may arise.



GRINDING A CYLINDER.

The raw material, as it comes into the works, is placed in the raw materials department in the basement, where more than fifteen hundred bins, racks and pigeon-holes contain all kinds of steel, brass, bronze and iron bars, tubing, wire, bolts, nuts, rivets and all the stock necessary to keep the factory

The engineering and experimental departments are important. In the Franklin factory these two departments occupy adjoining rooms; in the engineering and experimental departments new ideas are worked out and in the drafting room they are put on paper. These three divisions are under the direct supervision of John Wilkinson, whose work on the air-cooled automobile problem is well known. A competent corps of skilled men comprise his staff.



AUTOMATIC MACHINE DEPARTMENT

supplied. Electrical supplies and tools are also kept in the basement and also sheet aluminum. Sheet aluminum is used in large quantities by the Franklin factory for car bodies, the company claiming to be the largest users of this material in the country. Machines for cutting up raw stock are also located in the basement, where they are close to the material on which they work. Other stock of a more perishable nature, such as curled hair and leather for upholstery, lap-ropes, lamps, horns, carpet, rubber matting, hampers, and so on, are kept in the general stock room. In a special room, kept dark and cool, rubber tires are stored; it is stated that in the height of the season the average value of the stock in the tire room is about \$25,000. All raw materials are thoroughly inspected before being worked up, a force of about twenty men having this work in charge. Metals are subjected to physical and chemical tests. Coils and other portions of the ignition apparatus are inspected by electrical experts; bearings are run under heavy weight and at high speed.

Next to the raw materials department is the sundries stock room. Here are stocked finished parts of all kinds, all carefully classified and ready to be shipped at a moment's notice to the orders of dealers or users of Franklin cars.

Above, in the machine shop, there is a continuous low roar from two hundred lathes, shapers, milling machines, grinders, screw machines, drill presses and the numerous other machines required to turn out an automobile. Some of the automatic machines can take raw stock from an eighth of an inch in diameter—the thickness of the lead of a blue pencil—to six inches in diameter. The rod or bar goes into one end of the machine and comes out in the form of dozens of com-



EAGLE-EYED INSPECTORS PASS JUDGMENT ON EVERY PART.



WHERE THE MOTORS ARE TESTED BY THE EXPERTS.



ASSEMBLING ROOM WHERE THE CARS ARE SET UP.

pletely finished parts, all exactly alike, accurate to a hair's-breadth. Some of the automatic machine work is done with such extreme accuracy that gauges reading to one ten thousandth part of an inch are required to test the finished product. Specially constructed automatic recording micrometer measuring machines are used for the gauging in order to eliminate the possibility of human error.

Many of the special tools used in the factory are designed and built on the premises, a tool shop equipped with thirty-four machines and manned by a force of thirty-five men being devoted to tool making.

Every finished part of the Franklin car is closely inspected before being incorporated into a car. Fifteen men devote their energies to this work. The engineering department specifies exactly the limit of accuracy to which each part must be tested, and anything that varies in the slightest degree from the lines laid down must be rejected. The inspection process is carried along with the car as it takes shape, each part being tested for its working qualities when assembled. The transmission is a good example. Each of the gears and shafts has been separately tested and gauged, the gears have been tested for accuracy of contour and, in the beginning, the raw material was tested. But when the transmission is assembled it is given a final test to make sure that it works as it should, and that nothing has been neglected.

After the car has been completed, it is given a final inspection by men who do nothing else but go over finished machines and see that every nut and bolt and every single part, large and small, is in place and properly secured. The final test is the road test, after which the car goes to the shipping



SCENE IN THE WOOD SHOP—MAKING THE BODIES.

room, where sixteen men are kept busy weighing, crating, boxing and blocking automobiles in cars for shipment.

The commercial department occupies half the ground floor of one of the main buildings. In this department are the office and stenographic, production, cost, record, sales, foreign, purchasing, sundry, repair and bookkeeping departments; and there is even a legal department. A factory telephone exchange connects all departments by wire, and there is an inter-factory mail service that collects and distributes factory correspondence every half hour.

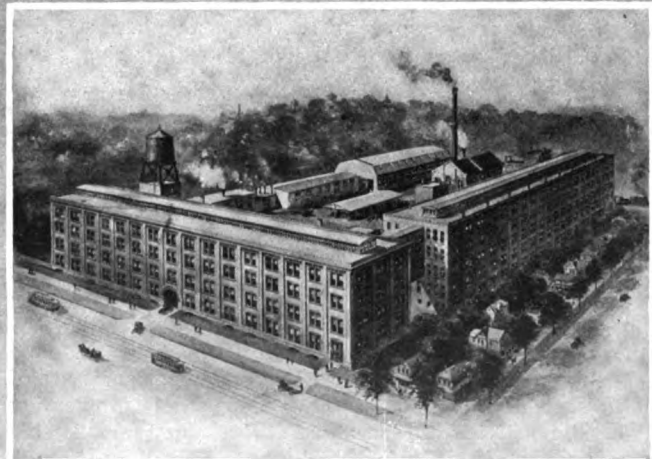
The exterior of the Franklin factory is entirely in keeping with its character as a modern manufacturing establishment. Everything is neat and clean and, moreover, is attractive. Smooth lawns and flower beds, through which are cut graveled roadways and asphalt footpaths, add much to the appearance of the place, as do also the clean, bright windows and the general air of freshness. These may seem small matters, but in reality they are important.



GAUGING THE CYLINDERS



SECTION OF PAINT SHOP, SHOWING TIERS OF BODIES.

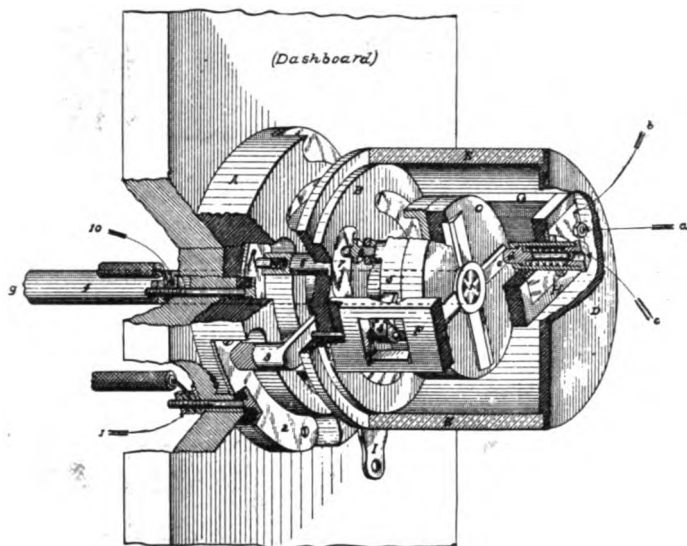


EXTERIOR VIEW OF THE FRANKLIN FACTORY.

NEW TIMER AND DISTRIBUTER.

A combined timer and secondary distributor, shown in the full-size engraving in this column and known as the Ellerslie distributor, manufactured by A. M. Lindsay, Jr., Minneapolis, Minn., embodies a number of meritorious features, one of which is that the wires connected to it are not required to move when the time of ignition is shifted. The visible sparking and the ease of cleaning are also good points.

Fiber plate *A* carries six brass segments (2) with bolts projecting back through the fiber. These are put through



CROSS SECTIONAL VIEW ELLERSLIE DISTRIBUTER.

holes in the dash, fastened by means of nuts, and all wires are fastened to these on the inside of dash, under hood at rear of engine, thus no wires pass through the dash and none move in any movement or action of distributor, and all are in plain sight and handy to get at. The shaft of the distributor proper is then inserted through center hole in fiber and through dash and proper connection made with engine. On the bottom or back of distributor are six tubes carrying in their ends steel balls under spring tension. These fit into curved slots in dashboard attachment, make contact with the brass segments, and at the same time allow of advancing the spark. All wires are connected and enter in this way, leaving the sides and top perfectly free to be removed for cleaning without touching another part, or in fact interfering with the working of machine. When the dash attachment is not used the wires are simply fastened by nuts to bolts which are used in place of tubes and ball contacts in bottom of distributor.

The distributor itself consists of a bottom piece of fiber *B*, carrying four brass distributing segments (7), and through which runs a shaft carrying on the end fiber plate *c*, which carries hardened steel star wheels and also brass ring 5 and distributor point 6.

A bridge of fiber (*F H G*) carries secondary circuit on one side, which it delivers by pall 4 to ring 5. On the other side is the primary, which it delivers by bolt *a*, plate 6, adjustable tube *c* and plunger *d* (all hardened steel) to star wheel *c*. A glass tube is slipped over this and a fiber top with a thumb bolt fastening to bridge *H* forms a perfectly dust and rainproof casing, and yet one through which every working part can be seen at all times, and on removing this they are all exposed, and being perfectly flat are easily cleaned.

All primary parts are hardened steel and make absolute wipe contact, and are adjustable. The secondary parts are of brass, also adjustable, so as to leave a slight gap, preventing all wear, intensifying the spark and at the same time allowing the operator to see every spark delivered to his plugs through the glass case. The easiest way to follow the two circuits on

the drawings is to follow small letters from *a* to *g* for primary, and figures from 1 to 10 for secondary. No wires pass through the dash or are covered in any way beyond the regular insulation. No wires twist or bend in any way. All wires are as accessible as the plugs. All parts are in sight from seat at all times. No oil or grease to gather dust and short circuit; an oil cup lubricates main bearing, and filling primary contact tube keeps a film of oil on all contact points. By removing top and sides in one operation by a single thumb nut, all interior parts are exposed in flat surfaces and may easily be wiped clean without even stopping the engine.

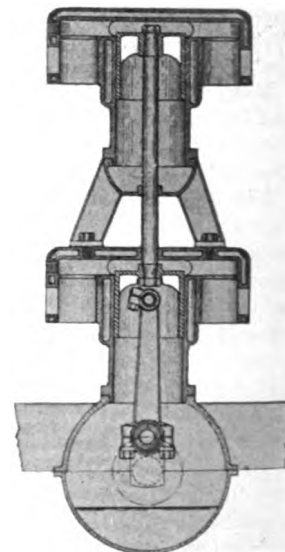
All wiring is figured so closely that under all ordinary working conditions the machine will not short circuit. If, however, a wire breaks or becomes disconnected, they are close enough to short circuit, thus notifying the operator and precluding all chance of burning out the coil.

A STEEPLE GASOLINE MOTOR.

With a view to producing an automobile motor of such constant torque that change-speed gears will be unnecessary, William G. Simpson, a consulting and constructing automobile engineer of Detroit, Mich., has designed and patented a steeple gasoline motor. The illustration is a reproduction of the Patent Office drawing and shows one pair of the steepled cylinders. There will be eight four-cycle cylinders altogether, and each pair of cylinders will work through a single crank and will produce an explosion at every revolution. Thus the crankshaft will receive a power impulse every quarter of a revolution, giving the same turning effect as two double-acting steam cylinders.

The piston rod of the top cylinder passes through a stuffing box in the head of the lower cylinder; the inventor states that this arrangement has been worked out satisfactorily. The engine which has been designed for a car has cylinders of $4\frac{1}{2}$ -inch bore and $4\frac{1}{2}$ -inch stroke and is intended to run at a normal speed of 1,000 revolutions a minute, at which speed it is calculated to develop 48 horsepower. The eight-cylinder steeple motor takes up exactly the same longitudinal space as a four-cylinder motor with cylinders of the same dimensions, but is, of course, of greater height; the height of the 48-horsepower engine in question is given as 29 $\frac{3}{4}$ inches from center of crankshaft to top of upper cylinder.

Mr. Simpson intends to place a steeple-engined car on the market for 1907, and states that the machine will have a gearless transmission for emergency use with air control; also air brakes and air clutch. Drive will be through gearing giving a ratio of 3 to 1. The wheelbase will be about 112 inches.

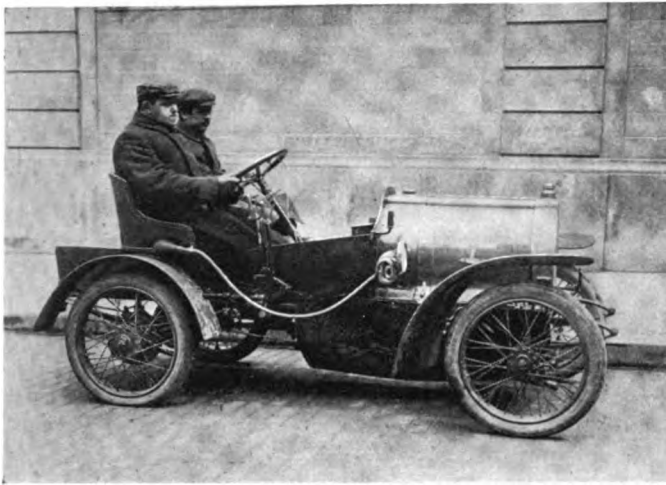


SIMPSON MOTOR.

REO COMPANY'S TWO NEW BUILDINGS.

LANSING, MICH., June 18.—The Reo Motor Car Company has broken ground for two new buildings, each to be 500 feet long and 65 feet wide. Each will be two stories high. They will extend in the same direction as the other buildings and will lie directly south of them. They are expected to be finished by August 1.

"We need more room," said R. E. Olds. "This will provide floor space of 65,000 square feet in addition to the 240,000 square feet we already have, and will considerably increase our capacity."



BARRIAUX IN 15-H.P. VULPES, FIRST-PRIZE WINNER.

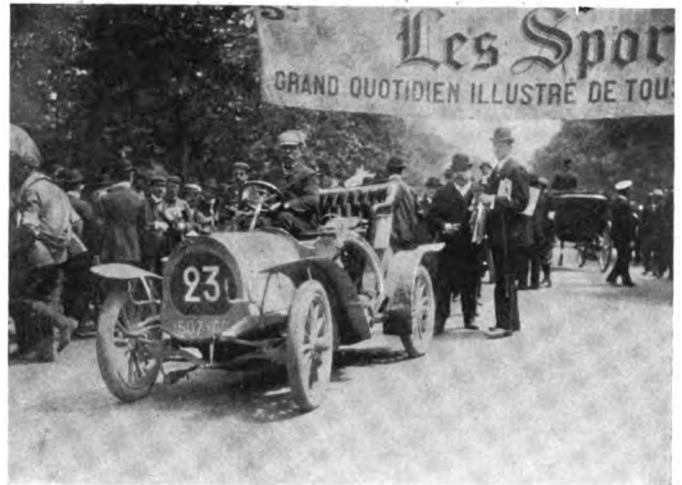
RESULTS OF TOUR DE FRANCE.

French annual competition for light cars and motorcycles—the Tour de France—has been concluded, and thoroughly demonstrated the practical utility of the low-priced motor car on European roads. The trial was organized jointly by the French Auto-Cycle Club and the Parisian daily *Les Sports*, and among the competitors were included 1,000-pound cars, tricars (touring and industrial), and motorcycles of a limited cylinder displacement (1-3 litre). A minimum speed of 30 kilometers an hour (22 miles) was imposed for all classes of vehicles, not on the ensemble of the tour, but on each stage.

The start was given by the officials of the Auto-Cycle Club at Port Maillot, the old starting point of the Paris-Bordeaux cycle race. Many of the machines entered since March did not start, owing to delay in completion, the result of the recent strike. However, more than 70 competitors in all classes took the road, and pursued the following itinerary: Paris, Orleans, Tours, Chateaulerault, Poitiers, Angoulême, Bordeaux, Agen, Toulouse, Cette, Montpellier, Marseilles, Avignon, Grenoble, Lyon, Macon, Belfort, Nancy, Reims, to Paris.

The Winning Voiturette and Its Able Driver.

Barriaux, the excellent driver of the Vulpes Company, who entered a racing monster in the Grand Prix, won the trophy for the voiturette category. The Vulpes voiturette is a runabout of 15 horsepower, four separated cylinders, pump and high-tension magneto (Lacoste) actuated by same gear, long pressed-steel frame with long "fore hands," allowing the radiator to stand right over the axle; three speeds and reverse, multiple-disk clutch (Hele-Shaw patent) and shaft driven. The car can



GRILLET IN 12-H.P. FOUILLARON, SECOND-PRIZE WINNER.

average a speed of 50 kilometers (31 miles), and weighs 1,200 pounds.

Winning Tricar and Its Unfortunate Competitor.

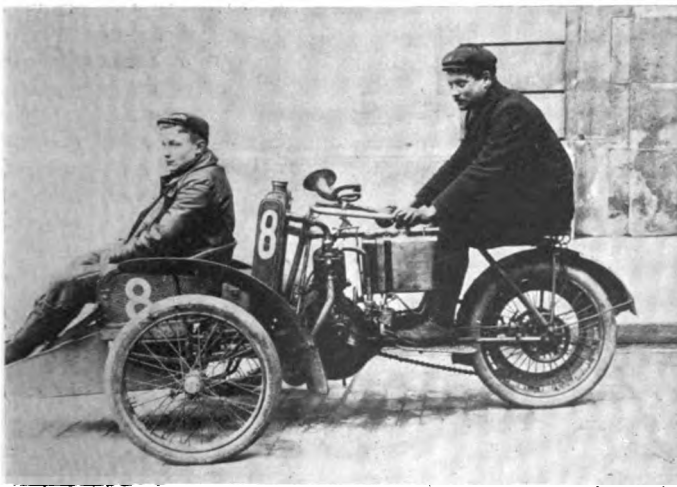
In the tricar class, the honors went to Schweitzer, driving the Austral machine, with 4 1-2-horsepower motor, water-cooled, fitted with an epicycloidal rear hub giving two speeds and reverse. Ignition by dry battery. The Austral tricar, as well as the others, carried one 140-pound passenger.

A type of tricar considered as one of the most perfect in France is the Contal Mototri. It is a compact and strong-looking machine, able to carry 500 pounds and the driver at a gait of 15 miles. The Contal people are the introducers of the Riviere hub, a geared disk which allows the operator to change speed with an ordinary clutch pedal. All the ignition, oiling and cooling parts (except the radiator) are protected by a metallic case placed at the rear of the carrier. The motor is one-cylinder, water-cooled, 5 horsepower. Several bad accidents prevented the Contal from classing itself honorably in the Tour de France.

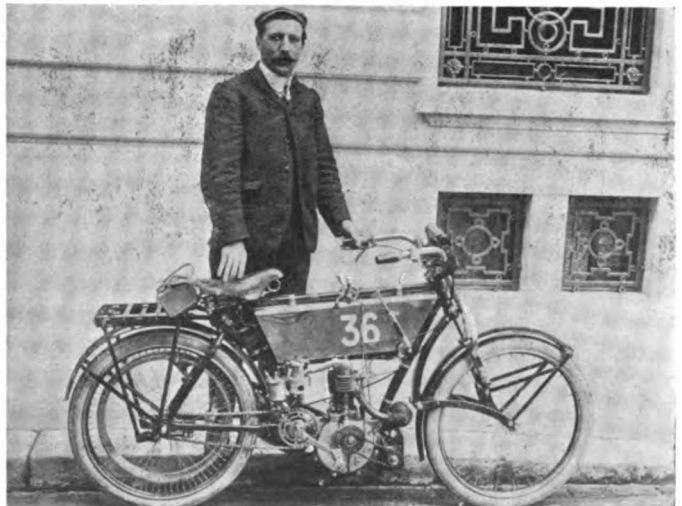
A good tricar sells in France for 1,400 francs (\$280). A great many are used in the retail trade by butchers, grocers, druggists, milliners, etc., and by the express deliveries.

Cissac Led the Motorcycle Brigade to the Finish.

Champion Cissac, who broke all road and track records for the past two years on the motorcycle, arrived first among the motorcyclists in Paris on his 2 3-4-horsepower Peugeot, having covered the last 120 kilometers in 2 hours and 11 minutes. His gasoline consumption averaged 5 liters (a trifle more than one gallon) per 100 kilometers (62 miles).



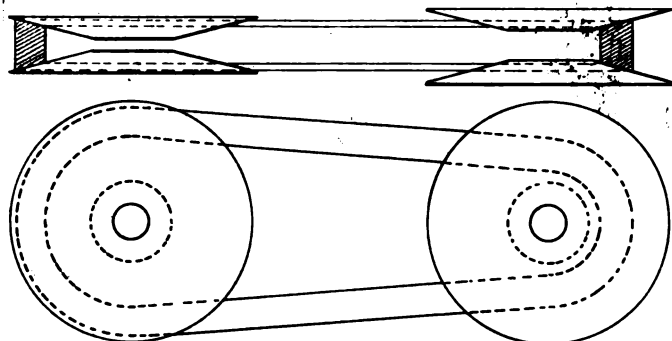
SCHWEITZER ON AUSTRAL, FIRST OF THE TRICARS.



CISSAC, FIRST OF THE MOTORCYCLISTS, WITH PEUGEOT.

EXTENSIBLE PULLEY CHANGE SPEED.

For a good many years "Old Friend Fouillaron," as they call him in Paris, in an ironical sort of way, had to fight bravely and endure the buffoonery of so-called experts and connoisseurs, who constantly shouted to the four winds that his invention was "no good." A. Fouillaron is the humble mechanic (to-day a prosperous motor car builder) who applied the extensible pulley as a



FOUILLARON'S EXTENSIBLE PULLEY CHANGE SPEED.

speed accelerator and slackener. The patent consists of two articulated pulleys, the first receiving its motion from the motor, the second transmitting its own to the driving shaft. The pulleys have two separate cheeks, each of which widen or grow narrow so as to form a large or small periphery for the adherence of a trapezoidal belt. A single lever—the speed lever—commands the widening or narrowing of both pulleys, and, as it may be plainly seen, the belt (of very much reduced length, as the pulleys are very close to each other) makes an up-and-down motion every time the driver maneuvers the speed lever, the tension of the belt remaining the same.

Fouillaron equips his voiturette with two and four-cylinder De Dion or Aster motors. The Fouillaron is considered as a very supple and swift little car. Eighteen speeds can be obtained, as the lever works on a sector bearing eighteen teeth. It is considered a very practical invention for traffic in crowded cities. The performance of the Fouillaron voiturette in the Tour de France was excellent.

WILLIAMSPORT'S SPACIOUS GARAGE.

What is claimed to be the finest automobile garage in northern Pennsylvania is shown in the photograph here reproduced. It cost some \$14,000 to erect and is commodious and equipped with every modern convenience for the proper



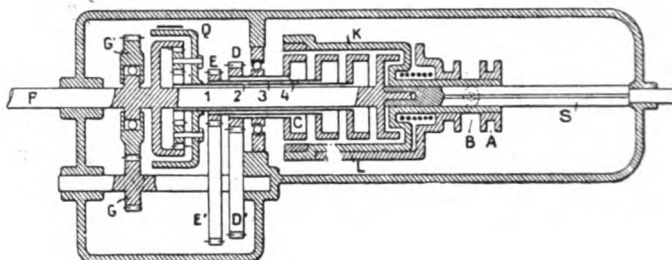
GARAGE OF THE WILLIAMSPORT (PA.) AUTOMOBILE EXCHANGE.

conduct of business and the comfort of patrons. It is owned by the Williamsport Automobile Exchange, which is a leading house in the trade in that city, being local representative for the White steamers, and the Reo and Premier gasoline automobiles.

A STUDY IN FRENCH RUNABOUTS.

Among the voiturettes (light runabouts) that are the success of 1906 in France, there is a very interesting little car built by Leon Demeester, whose name is attached to the history of the automobile. Demeester practically invented the motorcycle, of which he was the greatest champion in road and track competition for the last seven years. In 1904 he built a cheap runabout for his own use on entirely new principles and the car he has produced this year is considered in France as a model of perfection in its line.

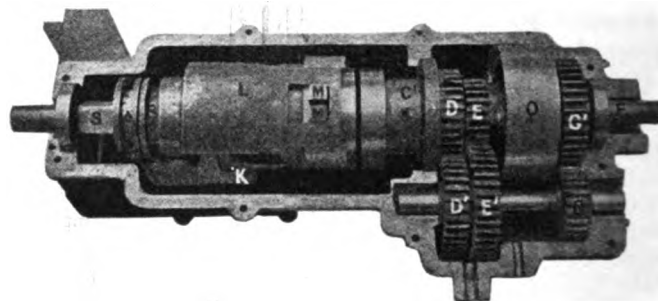
The chassis of the Demeester voiturette is of pressed steel, narrower in front so as to insure a better command on the front wheels; the "fore hand" springs are long enough to allow the radiator to stand right over the axle; on the rear.



SECTIONAL DRAWING SHOWING DETAIL OF CLUTCH.

they are also of a sufficient length, thus giving the body the best suspension possible. The joining of the cross pieces is obtained with strong brackets which give the chassis the desired rigidity. There are two models: the one-cylinder, 6 1-2-horsepower and the four-cylinder (68-76 millimeters). In the latter the motor is a bloc engine although the cylinders are separated between the top water jacket and the crankcase, made of aluminum. The gear box has three speeds and reverse. All the gears are always in mesh. The connecting rods placed inside the crankcase work in oil.

"To obtain the constant direct coupling in a gear box," says Demeester, "the wheels must be independent and free on one



MULTIPLE CLUTCH GEAR BOX, DEMEESTER VOITURETTE.

of the shafts, and to obtain a direct drive on the primary shaft, two different means are usually chosen—the claw-clutch or the friction. In both cases, those organs wear out sooner or later, and are liable to degenerate into sediment, and do some damage to other parts of the car. My gear box consists merely of four pulleys, on which can be applied a segmental brake forming a clutch. The segments, regulated by a reverse screw, revolve with the motor."

The Demeester voiturette is fast, reliable and perfectly noiseless. The four-cylinder type sells for about \$500.

In France criminal methods have kept pace with the automobile movement. Recently three men were arrested in Paris after having bought a number of cars on the strength of forged letters, paid for them with notes that were worthless, and sold the cars before the notes matured. When the men were arrested their headquarters was searched and many incriminating papers found. The extent of their swindlings was about \$20,000, and their operations extended over a period of about six months.

AUTOMOBILE CLUBS ACTIVELY AT WORK

New Jersey A. and M. C. Leases New Club House.

NEWARK, N. J., June 19.—Last week the New Jersey Automobile and Motor Club decided to rent the old Osborne mansion, 1034 Broad street, this city, for a term of five years. The house is one of the best-known landmarks in the city, and is located at the northeast corner of Broad and Chestnut streets. It is colonial in style, with seven tall columns supporting the portico, and is two stories in height. Very few changes will be made on the outside of the building, but the interior will be remodeled to suit the requirements of the club, which has appropriated \$3,000 to cover the cost of the alterations. Work will be begun on these on July 1, and it is expected the house will be ready for occupancy by September 1.

The basement will be fitted up as a dining room, and the first floor with reception rooms, parlor and smoking room. On the second floor will be located the reading room, billiard room, etc. There is ample room in the rear yard for a moderate-size garage. Chestnut street, which runs alongside the house, is asphalted, as is Clinton avenue, which begins directly opposite. For three years the club has been waiting for a home of its own, and it will soon be housed luxuriously and comfortably.

Next Sunday, June 24, the club will hold a run to the old Imlay homestead, near Trenton, and enjoy a typical country dinner. W. I. Fisk, of the house committee, has the dinner in charge.

There is talk of a race meet at Waverly track July 4, under the auspices of the New Jersey Automobile and Motor Club, but the date is not definitely settled. B. M. Shanley and J. W. Mason compose the committee in charge, and plans will be formulated this week.

A mass meeting of all the New Jersey automobile clubs will be held in Newark, some time between June 20 and June 28, under the auspices of the Associated Automobile Clubs of New Jersey. Judge James B. Dill, of East Orange; George H. Spear, prosecutor for Hudson county; Motor Vehicle Commissioner J. B. R. Smith, of Trenton, and other prominent speakers will address the meeting on the workings of the new law which goes into effect July 1.

Under the new law 3,000 automobiles have been registered to date, against 17,000 last year. New registration agencies have been opened with Charles Crisman, Branchville; Frank Reigerman, Seabright; Augustus R. White, Freehold; Charles R. Zacharias, Asbury Park; F. L. C. Martin, Plainfield; William Evans, Bridgeton; S. S. Smith, Rahway; William H. Hinnners, Edgewater; and John B. Brooks, Hackensack.

Six Hundred Orphans of Baltimore Given an Outing.

BALTIMORE, June 18.—The second annual orphans' outing and parade, conducted under the auspices of the Automobile Club of Maryland, was held June 14, with 75 cars in line. The starting point was the plaza in front of the clubrooms, and the route lay through the city to Electric Park, three or four miles out, where a special entertainment had been prepared for the children by the management. All the amusements at the resort were opened to the youngsters, and afterward ice cream and cake was served. It is estimated that 400 of the little tots took part in the outing. The committee in charge, consisting of Frank W. Darling, George S. Dickey, secretary of the club, and Lew S. Greensfelder, is now discussing plans for a similar trip for the inmates of the old people's homes and the hospitals for the incurable.

Cleveland Will Repeat Its Orphans' Day Run.

CLEVELAND, June 18.—Last year's Orphans' Day in Cleveland was such a successful affair that the Cleveland Automobile Club has decided to repeat it this year, and is arranging to hold the run some time during the month of July.

Still Looking for a Suitable Chicago Race Course.

CHICAGO, June 18.—After looking over the course in Lake county, near Libertyville, the members of the Racing Board of the Chicago Automobile Club have come to the conclusion that it will not be suitable for the road race which is to be given by the local organization in the fall. This course is a ten-mile circuit, but it was found that it was too narrow for two cars to pass each other in safety. Meanwhile the committee is searching for another course. The race will be for stock touring cars only, with full equipment.

Mr. Gregory and his committee are hard at work on the reliability tour which the Chicago Automobile Club is to give after the Glidden tour. The date has not been definitely set as yet, but it is known that the route will extend from Chicago to Milwaukee, from thence to Rockford, Ill., and back to Chicago.

It is possible that Chicago will have a hill-climbing contest in the near future. Several enthusiasts here point to Hubbard hill as the best place to hold it, and if the roads were suitably repaired it would make an ideal place for such a contest. At present the hill is in bad condition, the clay having a tendency to stick fast, but there is a great possibility of the road being repaved before long.

At a meeting of the directors of the Chicago Automobile Club it was decided to begin building operations at once on the new clubhouse, for which the site has been secured on Plymouth place, between Van Buren street and Jackson boulevard. Announcement was made by Secretary Sidney S. Gorham that ample money is now available to finance the construction of the building.

The success which attended the first annual Orphans' Day run of the Chicago Automobile Club on June 12 has prompted the directors to include it in the list of annual fixtures.

The annual tour of the Austin Automobile Club was held as per schedule June 9, and 70 cars were in the procession. The Chicago park system was visited, and the run finished at one of the North Side amusement gardens, where lunch was served. Mayor Dunne, of Chicago, was the guest of honor, and another prominent guest was President John Farson of the American Automobile Association.

Syracusans Are Arranging an Orphans' Day Run.

SYRACUSE, N. Y., June 18.—At the regular meeting of the club, held last week, it was decided to make arrangements for an orphans' run, at which time the inmates of the Onondaga Orphan Asylum will be given an outing. The children will be taken out the road to Jamesville, to romp on Fiddlers' Green, and fill themselves with sweetmeats, and will return by way of Orrville.

The club has appointed a special committee to look after the comfort and entertainment of the Glidden tourists when they arrive here July 13. Special cars will be chartered to take them to the White City, the Coney Island of Syracuse. About 400 tourists are expected. Four new members were elected at the club meeting.

Peorians Treat the Orphans to an Automobile Ride.

PEORIA, ILL., June 18.—Thirty-five orphans from the Home for the Friendless, in this city, spent the happiest day in their young lives on June 9, the Peoria Automobile Club, with twelve cars, taking them for a two-hour drive through the beautiful park system, fronting on the Illinois river, to Prospect Heights. At the observation tower a photograph was taken of the party.

Saturday, June 23, the club will hold its first annual race meet on the mile track here. The track is in fine condition, and it is expected Oldfield, who will be present, will do some record breaking in his Peerless *Green Dragon*. A card of amateur races has also been arranged.

New York Motor Club Adopts Plan to Supervise Contests.

NEW YORK, June 20.—At the last directors' meeting of the New York Motor Club, the action of the technical committee in giving an official supervision of a recent high-speed test, was approved, and a committee was appointed to draft a plan of procedure to be followed by the technical committee in the supervision of future manufacturers' contests, upon request. The action of the directors in thus preparing the way for systematic observation of such trials or contests it is believed will have a tendency to largely reform the situation with regard to promiscuous advertising of speed and hill-climbing trials throughout the trade.

A cablegram was sent by the club to Walter Wellman, who started from Paris on June 14 in his effort to find the North Pole by airship. Eight applicants for active membership and one non-resident member were admitted, and a committee was appointed to look up larger club quarters.

CLUB DOINGS IN GENERAL.

WORCESTER, MASS.—Orphans' Day will be observed this year by the Worcester Automobile Club, the governors having decided to make an effort to secure a larger turnout than last season's Orphans' Day. The arrangements are in the hands of Percival Whittall, chairman of the runs and tours committee. The date has not been decided on.

HOUSTON, TEX.—Good roads work is being commenced by the Houston Automobile Club in a practical manner. A county judge and a county commissioner were invited to accompany a club outing as guests of honor, and on the way the members pointed out road improvements that were needed. An active season of sporting and touring events has been planned.

NEW YORK.—Recent additions to the active membership list of the Automobile Club of America have swelled the total to 933, within 67 of the limit of 1,000 set by the club's rules. The club's associate membership list has reached a total of 217. Copies of the official report of the recent two-gallon efficiency test have been mailed to all members, also copies of the New Jersey automobile law which goes into effect July 1.

MINNEAPOLIS, MINN.—A speedway around Lake Harriet has been requested of the park board by the Minneapolis Automobile Club. The board has the matter under consideration. Secretary R. J. Smith of the club says that the organization is determined to have races during G. A. R. encampment week in Minneapolis, and unless a course is made by the city at Harriet, a week's program of races will be held at the Hamline track.

WILMINGTON, N. C.—The latest development in automobiling here is the organization of the Wilmington Automobile Club, with twelve members as a nucleus. It is planned by the club to erect a well-equipped garage at Wrightsville Beach, an adjacent pleasure resort, and as the club grows the country club feature will be added. The board of officers for the first year is as follows: President, Dr. A. H. Harriss; vice-president, George B. Elliott; secretary and treasurer, Walter Sprunt; directors, the above officers and Frank Herbot.

ST. LOUIS.—The Automobile Club of St. Louis is making active preparations for carrying good roads work into the Legislature at the next session, and plans to arouse public interest in the advantages to be derived from good roads throughout the country. A strong delegation will go to Jefferson City and urge the lawmakers to do something to improve road conditions. Kansas City is following the example of St. Louis, and the Kansas City Automobile Club is arranging for a "Good Roads Dinner," at which the members will discuss ways and means for securing improved highways. Prominent members of the National Good Roads Association have been asked to address the members, and the members of the county court will also be invited.

**THE AUTOMOBILE CALENDAR.
AMERICAN.****Tours.**

- June 21-26.—Second Annual Tour, Albany Automobile Club, Albany to Boston and return.
- June 23....—Rochester, N. Y., Automobile Floral Parade at Genesee Valley Park, Rochester Automobile Club.
- July 12-26.—Annual A. A. A. Tour, Chicago to Bretton Woods, N. H., Rules for the Glidden Trophy operative from Buffalo.
- Sept.....—500-Mile Endurance Test, Grand Rapids (Mich.) Automobile Club. (Date to be announced later.)

Race Meets and Hill Climbs.

- June 23....—Peoria, Ill., Race Meet of the Peoria Automobile Club.
- June 30....—Race Meet, Belmont Track, Philadelphia Automobile Association. Entries to R. M. Lacock, Turf Club, 1421 Walnut street, Philadelphia.
- July 4....—Race Meet, Newark, N. J., Waverley Track, New Jersey Automobile and Motor Club.
- July 3-4....—Chicago, Harlem Track, Race Meet.
- Sept.....—200-Mile Road Race, for the Farron Cup, Chicago Automobile Club. (Date and course to be announced.)
- Sept. 2....—100-Mile Road Race, on 25-Mile Circuit in Monroe County, N. Y. Rochester Automobile Club and New York State Automobile Association.
- Sept. 22....—American Elimination Trials for Vanderbilt Cup Race (Long Island Course probably.)
- Oct. 6....—Vanderbilt Cup Race American Automobile Association.

Motorcycle Tours and Contests.

- July 3-7....—Annual Endurance Run and Meet, Federation American Motorcyclists, Rochester, N. Y.
- July 4....—Tour to Rochester, N. Y., New York Motorcycle Club.
- Sept. 3....—Race Meet, Muskegon (Mich.) Motorcycle Club.

FOREIGN.**Shows.**

- Sept. 1-8....—Canada International Exhibition. St. John. New Brunswick.
- Oct. 5-14....—Leipzig (Germany) Exhibition, Krystall Palast.
- Nov. 1....—New Zealand International Exhibition opens at Christchurch.
- Nov. 1-16....—Berlin (Germany) Automobile Exhibition.
- Nov. 15-24....—London, Olympia Motor Show.
- Nov. 23-Dec. 1....—London, Stanley Show, Agricultural Hall.

Tours.

- July 26-Aug. 15....—Circuit Européen, 3,000 miles, Paris, Milan, Vienna, Berlin, Cologne, Paris (postponement probable).

Races, Etc.

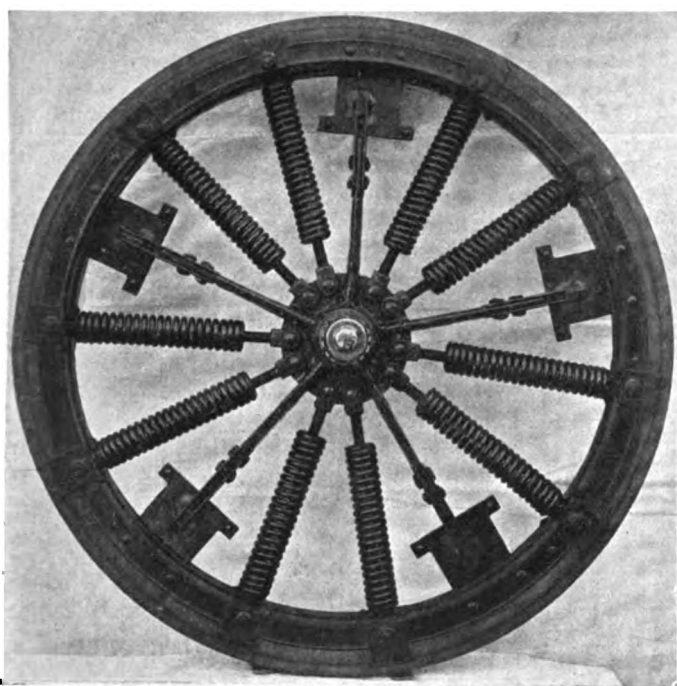
- June 26-27....—Le Grand Prix, Sarthe Circuit, France.
- July 8....—International Cup Race for Motorcyclists, Cesky Cluo Motorcyclistu of Austria.
- July 15....—Suze-Mont Cenis Hill Climb (Italy). Automobile Club of Turin.
- Aug. 1-15....—Circuit des Ardennes (Belgium).
- Aug. 9-12....—Malchamps (France) Hill Climb Tests.
- Aug. 15-16....—Ventoux (France) Automobile Meeting.
- Aug. 14-19....—Ostend (Belgium) Meet.
- Aug. 18....—Liedekerke Cup Race.
- Aug. 23....—Semmering Hill Climb.
- Aug. 27-Sept. 2....—Brescia (Italy) Automobile Meeting.
- Sept. 3....—Auvergne Cup Race, France.
- Sept. 27....—Tourist Trophy Race, Isle of Man, A. C. of Great Britain.
- Oct. 7....—Chateau Thierry (France) Hill Climb.
- Oct. 23....—Gaillon (France) Hill Climb.

Motor Boat Races.

- June 28-29....—Kiel (Germany) Motor Boat Races.
- July 1....—Maison Lafitte (France) Motor Boat Races.
- July 8....—Le Coupé Dubonnet (France) Motor Boat Races.
- Aug. 6....—Motor Boat Race on the Rhone (France).
- Aug. 9....—British International Cup Motor Boat Race.
- Aug. 20-23....—Ostende (Belgium) Motor Boat Races. Dover to Ostende.
- Sept. 16....—Juvisy (France) Motor Boat Meeting.

A RESILIENT WHEEL FROM NEBRASKA.

The latest production in spring wheels is by James F. De Jarnette, of Omaha, Neb., who organized the Eby Manufacturing Company, with a capital stock of \$100,000, to manufacture the same. By referring to the illustration it will be seen that there are five metal spokes projecting from a metal hub, not extending to the rim, but terminating in sockets attached to the rim, so that they are allowed considerable movement, but still have ample strength. Between the spokes are placed helical springs as shown in the cut, one end of each spring being secured to the hub and the other end to the rim. Thus, the wheel is virtually a suspension wheel, with spring spokes and auxiliary strengthening spokes. The lower springs are compressed and the upper springs extended by the weight of the car, the weight being transferred from one spring to another as the wheel rolls forward. The springs that are horizontal are also slightly compressed or extended, and add to the resiliency of the system. The springs do not, of course, have to transmit driving stresses, these being taken care of by the spokes.



DE JARNETTE SPRING WHEEL FOR AUTOMOBILES.

The manufacturers state that a set of these wheels has been tested on a Rambler car, for 1,000 miles, with excellent results. The wheels weigh considerably more than the pneumatic-tired variety, but this feature, the inventor states, can be remedied if necessary. James F. De Jarnette is president of the new company, H. E. Johnson, vice-president, and J. J. De Jarnette, secretary and treasurer.

AKRON'S FIRST AND LATEST AUTOMOBILE.

AKRON, O., June 18.—O. C. Barber, the Akron Diamond match king, has purchased his first automobile, a large touring car, said to be one of the finest in the state. It is the latest to arrive in Akron, and was a special object of interest to Achille Philion, who brought the first automobile to Akron in 1893.

"There is quite a difference between the first and last automobile in Akron," said Philion, as he surveyed the handsome Barber car; "I still have the first one. It is a steam machine with a small upright boiler and is a novelty now. Several automobile firms have offered me fancy prices for it, to show the evolution in the manufacture of automobiles, but I wouldn't part with it."

A FAMILY TOUR FROM DENVER TO THE EAST.

It is certainly an unusual thing for a man to take his wife and family of six children, the youngest of which is a baby less than a year old, and attempt to make a trip of several thousand miles in an automobile. This, however, is exactly



MAYOR BRADLEY AND HIS FAMILY IN HIS POPE-TOLEDO.

what C. A. Bradley, Mayor of the city of Longmont, Col., is starting out to do this week in his 30-horsepower Pope-Toledo. Mr. Bradley has made arrangements to make the trip by easy stages, and will make a tour of the Eastern states before returning home. The illustration shows how the family looks when seated in the car. Mayor Bradley certainly is not an advocate of race suicide.

HORSES BECOMING RARE, WILL PURSUE AUTOS.

INDIANAPOLIS, IND., June 18.—Automobiles having lessened the use of horses, and hence having eliminated to a certain degree the theft of horses, the Indiana Horse Thief Detective Association has announced that it will turn its attention to alleged violations of the Indiana automobile laws.

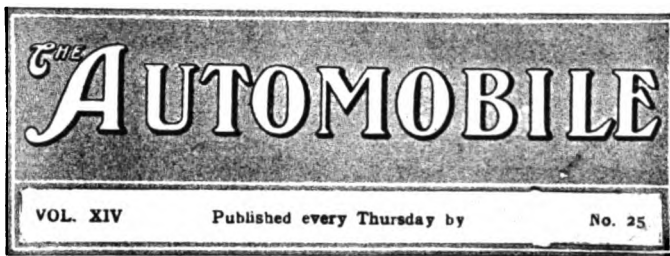
SOME STRENUOUS STEP-CLIMBING IN IOWA.

To show the capability of the 22-horsepower Mason car, which is manufactured by the Mason Motor Car Company, Des Moines, Ia., a test was recently made by the superintendent of the factory, F. S. Dusenberg, who drove the car up the State Capitol steps in that city. As will be seen by the illus-



MASON CAR CLIMBING CAPITOL STEPS, DES MOINES, IA.

tration, the photograph of which was taken while the car was making the climb, it was no easy task. There was a total of forty-seven steps to be mounted, but the Mason did the trick. The motor of the Mason car is a two-cylinder opposed, with five-inch bore and five-inch stroke.



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Urgent Need of a National Registration Law. With the increase of automobilism in the United States the necessity for a national law governing the licensing of cars grows more apparent, and a national law regulating speed might not be too radical a measure for the broad minded to consider. A prominent automobilist has figured it out that it requires nine different licenses to make a trip of 600 miles from Boston to Baltimore, going by way of Providence and passing through the large cities on the route, a feature which in itself is ridiculous in the extreme and cries loudly for a remedy. Automobiledom is suffering to-day from over-legislation on the license question and it is none too early to begin the agitation for sensible national measures.



Storage Battery Experiments and Facts.

While a storage system of lighter weight for use in electric vehicles would undoubtedly be welcomed by both the manufacturer and purchaser, there is little likelihood of a radical change in the near future in battery construction, due to the recently reported discoveries of large quantities of cobalt in the western section of North Carolina. These cobalt beds have been known to exist for a number of years, and as the application of that mineral for use in storage battery construction is yet in an early experimental stage, a considerable period of time must elapse before the perfected product could be put on the market should the experiments prove successful. Intending buyers of electric vehicles are safe in purchasing the standard products.

The Growth of Automobile Route Information. We presume there are a few copies in existence of the Official Automobile Blue Books for 1901 and 1903, the result of the first attempts to map out routes especially for auto touring in this country. If those who still have the 1901 edition will place it alongside "The Automobile Official A. A. A. Blue Book," recently issued, the growth of five years will be shown in a very striking manner. The outside cover of the original volume reached exactly to the top of the gold-leaf imprint on the latest volume.

A still greater contrast is shown by the inside pages on which the routes are listed, the dimensions being 5¾ inches by 3¾ inches in the 1901 edition, as against 8½ x 4½ in the 1906 edition. Expressed in type area, there are only 21.56 square inches on the smaller page to 38.25 square inches on the larger page.

There are exactly 68 net pages of route matter in the original Blue Book, with more than half of these pages partly blank. Nearly as much type is used for the Boston section alone of the new volume as the aggregate of route matter in the earlier volume; add any other one of the New England sections to Boston and the two will greatly exceed the total type area of routes in published form five years ago.

The present Blue Book contains 54 sections in all, which, as a piece of publishing, would make about twenty of its prototype. Is there anywhere else a growth in automobiling more striking than this?



A. C. A. Commercial Vehicle Trials.

The announcement that the Automobile Club of America will hold trials of commercial vehicles this summer will be received with satisfaction by those who are interested in this special branch of automobile construction. It is now two years since a public test of these vehicles was held in America, and in the intervening time there has been very considerable improvement in design and construction. This has naturally followed the greater experience had with the use of such vehicles and the constantly increasing number of constructors interested in the problem.

It is no longer necessary to hold a test simply to demonstrate that a load varying from 500 to 10,000 pounds can be carried at a considerable rate of speed over city streets. The industry has progressed beyond this stage. But it is very desirable to bring to the attention of the public the progress which has been made in adapting the power vehicle to a great variety of special services. It is to be hoped, therefore, that the trials will have the hearty support of the builders and that as great a diversity of types as possible will be entered. Vehicles of the passenger type, especially, are of great commercial importance. It is the feature of publicity that is really the chief value of a commercial vehicle contest that can be carried out by any organization such as the A. C. A. The very diversity of types, while publicly illustrating the universality of the machine, makes analysis on a competitive basis difficult, if not impossible. And to get results that would satisfy all the reasonable inquiries of the user is more difficult yet. For example, a test conducted in summer would not be conclusive as to the practicability of the service by the same vehicles in the depth of winter. The question of economy, too, which now is so frequently asked, cannot be answered by any tests of brief duration, but must be worked on a practical and scientific basis covering an extended period of time.

It is in these directions that the trials of commercial vehicles fall short of what can be accomplished by tests of pleasure vehicles, along similar lines, which latter afford an excellent measure of value—positive and comparative. Those who await the results of the forthcoming trials should bear these limitations in mind and not expect the promoters to do the impossible.

ITALY'S VANDERBILT TEAM.

Cable advices announce that the Automobile Club of Italy has nominated the Italian team for the Vanderbilt cup race, and that the formal entries, together with draft for the entrance fees, were mailed on June 9. The entries represent three Fiat and two Itala cars, and the team will be made up of Lancia, Nazzaro, and Dr. Weilschott, who will drive the Fiat racers, and Cagno and Fabry, who will pilot the Itala machines. The Fiat contingent of drivers will sail for America immediately after the running of the Brescia Cup in Italy, September 10. The above information comes upon the authority of E. R. Hollander, of the Automobile Club of America, who was appointed during his recent visit to Italy as the provisional delegate to represent the Italian governing body on the Vanderbilt Cup Commission, and is authoritative.

Other cable advices received announce that there will be at least one British car in the race, an English Daimler, which will be driven by either Guy Vaughan or H. N. Harding. E. S. Partridge, of the Automobile Club of America, who is identified with the Daimler interests in this country, sailed last week for England to confer with the makers regarding the racer. If a special racing machine cannot be built in time, a 1907 stock car will be used with such changes as are necessary to bring out its full quota of speed.

Locomobile Company Will Enter a Car.

From the factory of the Locomobile Company, at Bridgeport, Conn., comes the announcement that there will be a Locomobile racer for the Vanderbilt cup. The machine is a duplicate of last year's racing car, with a four-cylinder motor that will develop about 100 horsepower. Joseph Tracy, who last year drove the Locomobile in the Vanderbilt race, securing third place, will drive the car in the great American classic on Long Island next fall.

Shepard May Drive the Hotchkiss.

Elliott F. Shepard will be one of the two amateur drivers in the Vanderbilt cup race, provided the Hotchkiss cars get a place among the leading five machines in the coming Grand Prix race in France. Mr. Shepard is entered to drive one of the three 120-horsepower Hotchkiss cars in the French race, and should he finish inside of fifth position will undoubtedly pilot the Hotchkiss in the Vanderbilt race.

Matheson Car Formally Entered Some Time Ago.

In last week's issue of *THE AUTOMOBILE* it was stated that the Matheson was among the probable entries for the Vanderbilt race. This is incorrect, as the Matheson Company made formal entry and paid their entrance fee some time ago. Their car is well on the way toward completion, and it is possible that these makers will be able to enter another one. The Matheson racer will be the regular stock model for 1907, and after the race will be used for demonstrating purposes.

ECONOMY TEST POSTPONED TILL AUGUST.

At a meeting held Saturday, June 15, the Contest and Technical Committee of the New York Motor Club decided to postpone the Economy Test scheduled to take place June 20-22 until Wednesday, Thursday and Friday, August 29, 30 and 31. The action taken was in deference to the wishes of a number of manufacturers, who stated that though they desired to enter cars for the June contest, it was practically impossible to do so owing to the heavy pressure of business at this time of the year.

All those who have entered have signified their intention of allowing their entries to remain for the postponed date. All the officials of the tour have agreed to act in August, and arrangements will be exactly the same as if the tour had been held this week, as originally projected.

B. F. GOODRICH CO. WITHDRAWS.

Notice was given by the B. F. Goodrich Company, of Akron, O., at the meeting of the Automobile Tire Association, held in New York, June 15, that it would withdraw from the association in September, at which time the agreement at present existing between the tire manufacturers will expire.

Reasons Given for Goodrich Quitting the Pool.

AKRON, O., June 18.—Foreign tires and price cutting by other manufacturers are given by the B. F. Goodrich Company, of this city, as the chief causes for the withdrawal of that company from the Automobile Tire Association, as per notice served at the meeting in New York last Friday. By the action of the Goodrich company this association, it is said by members, will be dissolved entirely on September 1, when the notice of the Goodrich company goes into effect. The association is the largest and strongest organization of tire makers in the country, and included besides the Goodrich people the Diamond Rubber Company and the Goodyear Tire and Rubber Company, of Akron. Five other large tire manufacturers are in the association, which was formed among the lessees and owners of the G & J tire patents. The G & J Tire Company, of Indianapolis, is one of the members, and the organization was for mutual protection.

An official of the Goodrich company to-day stated that 10 per cent. of the tires used in this country the past year were imported, and this and the cutting of prices by manufacturers outside of the pool led the Goodrich company to decide that it would be better to withdraw from the agreement. The expense of replacing tires was another element that entered into the action dissolving the agreement. It is believed that this will have the effect of decreasing the cost of pneumatic tires to consumers.

Officials of the Goodrich company deny that the action of the government against manufacturers, combines and trusts has anything to do with the decision to abandon the tire association.

EDITOR BATCHELDER SAILS FOR FRANCE.

Managing editor A. G. Batchelder of *THE AUTOMOBILE* sailed via steamship *La Touraine*, June 14, for France, where he will witness the Grand Prix of the Automobile Club of France, June 26-27, and in his capacity as a member of the Vanderbilt Cup Commission and member of the racing board of the American Automobile Association, confer with Chairman J. de Mont Thompson on the matter of foreign entries for the Vanderbilt cup. Mr. Thompson sailed two weeks ago. A wireless message received from Mr. Batchelder on Saturday evening stated the voyage was perfect to that time.

NEW YORK DEALERS' MASS MEETING.

A dealers' mass meeting has been called by the board of governors of the New York Automobile Trade Association, to be held at the Empire Hotel, that city, Thursday, June 21, to discuss the advisability of making a demand on the manufacturers for an increase in the present discount allowance. The meeting is open only to dealers belonging to the association.

NEW BRIDGE OPEN AT AMBOY, N. J.

Automobilists in the vicinity of New York will be glad to learn that the new bridge between Perth Amboy and South Amboy, N. J., has at last been opened to the public, Tuesday of this week being the official day set for the opening. The bridge shortens the customary touring route by a number of miles from New York to Long Branch and other points in New Jersey along the shore.

AN AMERICAN ACTOR'S SUMMER TRIP.

Theatrical folks seem to take naturally to the automobile and enjoy the pleasures of its locomotion to the full. The engraving shows Walter Hale, a well-known actor and leading man in John Drew's company, and Mrs. Hale in their 20-horsepower Cleveland runabout, with which they will tour from Gibraltar to the North Cape, collecting materials



MR. AND MRS. WALTER HALE IN 20-H.P. CLEVELAND.

for a new automobile novel and for magazine articles. The car has been specially equipped for touring, but the travelers will go light, sending their baggage from point to point by rail.

WASHINGTON DEALERS' AUTOMOBILE MEET.

WASHINGTON, D. C., June 18.—The newly formed Washington Racing Association, composed exclusively of dealers and salesmen, held its first race meet at the Bennings track, June 16. There was a fair turnout of enthusiasts, and the sport proved very interesting. The program was made up of events for stock cars with regular equipment.

The best race of the day was a free-for-all at five miles, which was run in two heats and a final, and was won by M. Bird in a Packard, in 7:10.4-5. The three-mile event for gasoline cars was won by L. Jullien in a Reo, in 5:28.4-5, and an event of similar distance for runabouts was won by J. Fister in a Buick, in 5:20. R. Morgan, with a Stanley, won the race for steam cars, and the three-mile race for members of the Automobile Club of Washington was captured by S. L. Harris, in a Reo, in 4:57.2-5.

RACE PROMOTING ASSOCIATION FORMED.

CHICAGO, June 18.—The Western Automobile Racing Association filed articles of incorporation at Springfield, Friday, June 15, asking for a charter. The new association is capitalized for \$2,000 and William Pickens, a promoter of meets for the past two or three years, and also manager of Barney Oldfield, is president. The promoters intend to hold meets in various of the larger cities of the United States and Canada during the present summer and fall. Chicago will get the first of the meets, as a two-day tournament will be held at the Harlem racetrack July 3 and 4. Prizes aggregating \$3,500 will be offered, and an additional \$2,000 in gold for the open professional race.

DUGALD CLERK WILL VISIT AMERICA.

Early in July, Dugald Clerk, of London, who is said to be the greatest living authority on gas motors, will sail for this country. It will be Mr. Clerk's first visit to the United States. In the early stages of the Selden patent litigation he was retained by the plaintiffs, and while here will give testimony before the United States Commissioner in the suit now pending.

AUTO RELAY FROM CHICAGO TO NEW YORK

Monday morning, June 18, at 8 o'clock, the automobile relay trip from Chicago to New York of the Hearst daily papers was begun. The courier, who was transferred from auto to auto during the 1,024 miles, carries a dispatch from Brig.-Gen. William H. Carter, commanding the Department of the Lakes, to Brig.-Gen. Frederick D. Grant, of the Department of the East, stationed on Governor's Island. Such noted drivers as Jerry Ellis, Webb Jay, H. W. Lyttle, Percy Owen, and Gaston Plaintiff participate in the journey, the schedule for which is being carried out at time of going to press.

Re-lays.	Miles.	Total Miles.	to	Time Due.
1st	55	55	Valparaiso, Monday.....	10:30 A. M.
2d	53	108	South Bend	12:20 P. M.
3d	62	170	Kendallville	3:30 P. M.
4th	41	211	Bryan	5:30 P. M.
5th	66	277	Toledo	9:00 P. M.
6th	66	343	Norwalk, Tuesday.....	12:00 A. M.
7th	55	398	Cleveland	2:30 A. M.
8th	55	453	Ashtabula	5:00 A. M.
9th	41	494	Erie	7:00 A. M.
10th	30	524	Westfield	8:30 A. M.
11th	33	557	Jamestown	10:00 A. M.
12th	33	590	Salamanca	11:30 A. M.
13th	56	636	Wellsville	2:30 P. M.
14th	28	664	Hornellsville	4:00 P. M.
15th	41	705	Corning	6:00 P. M.
16th	35	740	Waverly	7:45 P. M.
17th	43	783	Binghamton	10:00 P. M.
18th	34	817	Unadilla	11:30 P. M.
19th	38	855	Delhi, Wednesday.....	1:30 A. M.
20th	68	923	Kingston	5:00 A. M.
21st	41	964	Newburg	7:00 A. M.
22d	60	1,024	New York	10:00 A. M.

EXPERIENCED HORSEMEN AS CHAUFFEURS.

One of the noteworthy features of the season is the interest taken by wealthy owners of automobiles in the education of their employees in the art of managing and driving their cars. There is a tendency on the part of employers to provide automobile tuition for the men who have been driving their horses for a number of years, which indicates that not only must the side of mechanical proficiency be considered a factor in the education of a chauffeur, but experience as a driver of horses and in the management of carriages in crowded streets is a matter of great value in the handling of an automobile. The New York School of Automobile Engineers, located on West Fifty-sixth street, has among its students a very large percentage of experienced coachmen employed by wealthy families. The class of instruction given is of the very best, and the results shown are bound to have a good effect on public opinion in the future. The management of the school reports that the horsemen have made particularly apt scholars, in road work, especially. As soon as they have mastered the changes of gears, application of brakes, starting and stopping, etc., they become proficient in the management of the car very quickly. Their past training is very useful, as it makes them quick to observe, and as they possess a knowledge of the rules of the road, they become particularly valuable as careful drivers in these days of rather reckless driving.

AERIAL NAVIGATION AT THE CAPITAL.

WASHINGTON, D. C., June 18.—Aeronaut Lincoln E. Beachey gave a notable demonstration of the possibilities of aerial navigation with motor power in this city on the morning of June 14, in Knabenshue's airship No. 2, in which he left Luna Park, four miles south of Washington, and anchored in the Washington Monument grounds. After crossing the Potomac river, the spectators saw Beachey step toward the front of the airship and by his weight bring the machine toward the earth. He was then probably 600 feet above the ground. When at the desired height he made a shoot for the Washington Monument, and as he neared it he again stepped toward the front of the machine, and the airship glided gracefully toward the earth. While the airship was hovering over the Potomac river, just to show the public how perfect his control over the machine was, he cut several figure 8's in the atmosphere and dipped and raised the airship at will by sliding forward and backward on the three rails beneath the gas bag.

P. L. HUSSEY ORGANIZES NEW COMPANY.

A new company has been formed to carry on the manufacture of drop forgings for automobiles, succeeding the Hussey Drop Forge and Manufacturing Company, of Cleveland, O., to be called the Cambria Forge Company, located at Johnstown, Pa., and capitalized at \$150,000, with \$125,000 paid in. The officers of the new company are: W. Milt Brown, president; R. P. Smith, vice-president; C. G. Campbell, secretary-treasurer; P. L. Hussey, general manager. The board of directors includes John Waters, president of Johnstown Radiator Company; J. W. Walters, president of Johnstown Lumber Company; W. Milt Brown, electrical engineer of Lorain Steel Company; C. G. Campbell, treasurer of Johnstown Lighting & Heating Company; John McClean, Pittsburg Steel Company; R. P. Smith, capitalist, and E. B. Entwisle, chief engineer of Lorain Steel Company.

The manufacturing plant is being completely equipped and will be of modern type. The forge shop is 125 feet long and 65 feet wide, and there is a die sinking shop 60 by 35 feet and two stories high. The machine specialty department is also 60 by 35 feet. The large forge shop is run by two separate power units, while each of the other departments has its individual power unit. Special roughing-out, breaking-down and board hammers have been installed for working nickel and chrome steels; the board hammers have been set close together so that reheating of these sensitive steels will not be required. Oil furnaces will be used for heating, and with these a very uniform temperature of any desired degree may be maintained—a matter of the utmost importance in working nickel and chrome steels. Trimming presses for hot-trimming the forgings are set close to the hammers, so that the work will leave the shop as close to size as possible. There are eleven hammers, varying from 150 pounds to a ton and a half, and a bender and an upsetter. Air compressors of the latest type have been installed, so that there will be ample blast on the dies to keep them clean and clear of scale and refuse. The excellent arrangements for making drop forgings of modern automobile steels of high tensile strength are particularly interesting.

This plant will, it is anticipated, be in active operation the latter part of August. Meantime the Cleveland plant is running day and night and taking care of orders promptly.

WARNER COMPANY ADDS A NEW LINE.

A new line of business has been taken up by a firm that has for some time been making cut-meters and automobile speed indicators—the Warner Instrument Company, of Beloit, Wis. The United States battleship *Georgia* is equipped with tachometers or revolution counters made by the Warner company to indicate the engine speeds, and these instruments are so delicately constructed that they are said to be capable of registering an angular speed as low as one-tenth of a revolution per minute. These instruments were built at the request of the chief engineer of the Bath Iron Works, where the *Georgia* was built; the engineer used a Warner speed indicator on his car and saw the possibility of using the same principle in a revolution counter.

Another instrument turned out by the same concern, especially for the government, is a wind-gauge made for the use of gunners in making allowance for windage on their projectiles. The new instruments are capable of registering the speed of a zephyr blowing at the rate of two miles an hour. The first order from the government called for 150 wind-gauges.

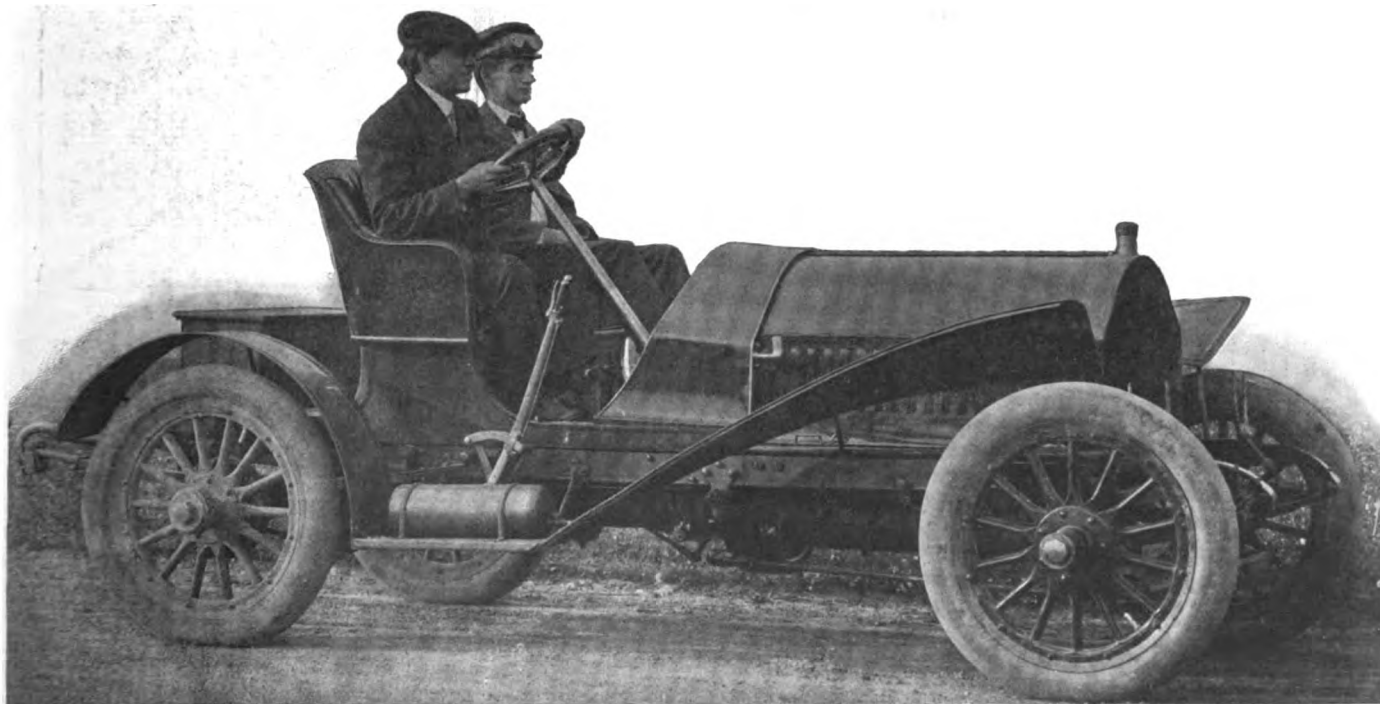
The new business has necessitated the erection of a new plant in Beloit, and a factory 100x200 feet will be put up. The location has not yet been chosen, but this and other details will be settled at an early date.

QUAKER CITY TRADE HAPPENINGS.

PHILADELPHIA, June 4.—The American car will be represented here by E. Wurster, of the American Automobile Garage, at 933-937 North Seventh street, who last week secured the agency for Eastern Pennsylvania and South Jersey.

A sub-agency for the Queen car has been assigned by the Hamilton Auto Company, of this city, to Thurlow & Richardson, of Wilmington, Del.

So extensive will be the alterations required at the new quarters of the Rambler, at No. 207 North Broad street, that the changes amount to a practical rebuilding. The big three-story building, extending back to Watts street, will be devoted in its entirety to garage, repair, and salesroom purposes—the first floor having the salesrooms on the Broad street front, with offices separating them from the garage.



WILLIAM KELLY, DESIGNER, AND JESSE DRAPER, GENERAL SALES MANAGER, WAYNE AUTOMOBILE COMPANY, IN WAYNE 50-HORSEPOWER VANDERBILT CUP RACER.

AN INTERPRETING WAY TO ADVERTISE.

Out on the roads of the West, in Iowa, the accompanying photograph of a novel advertising scheme was taken. The machine is an Oldsmobile and belongs to the Stowell Manufacturing Company, of Chicago, a branch of the Jersey City firm of that name. Manager Erringer, of the Chicago office, is responsible for the idea. The Stowell company manufac-



4.4.2.2. MASSS FITTED WITH MODEL OF ROUSE

...adding the ability to raise on the car is made of the stainless steel, adding a solid 100. Adding more than to eight thousand dollars for an excellent advertising medium and a new way to get your name out there. This is the second time in the history of the world that a car has been built.

EXAMPLES OF TRADE HAPPEVINGS

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CLUBMAN LIGHT COMMERCIAL DELIVERY CAR

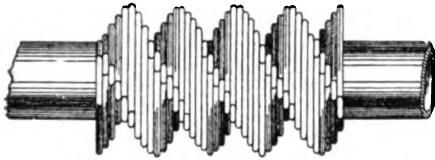
and the "Lumber Cut," shown in the cut. It weighs 4000 lbs. and has ample power and strength to carry 10000 lbs. It is a good, varying from four to six feet in height. Quite a number of these cars are in use in the various throughout the country, every one of which is giving excellent satisfaction. The weight is but little and is very sufficient for any service that could be handled by a lumber delivery wagon.

Patents

Radiator Tube.

No. 822,372.—J. G. A. Kitchen and L. R. Perkins, of Lancaster, England.

This is a tube on which the radiating surface is supplied by a helix of wire or ribbon bent in angles substantially as indicated in



WIRED RADIATOR TUBE.

the end view, so that when slipped over the tube it will hold itself in place without soldering if desired.

Copper Water Jacket.

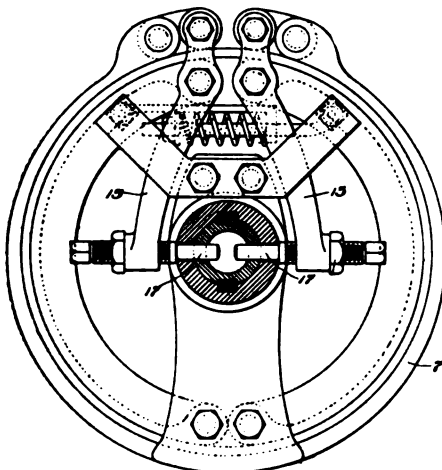
No. 822,326.—F. H. Tryon, of Utica, N. Y.

This is a copper jacket, made in sections suitably conforming to the shape of the cylinder and joined together by soldering or brazing.

Friction Clutch.

No. 822,454.—H. F. Hubbard, of Avalon, Pa.

The design of this clutch adapts it to



DOUBLE-ACTING BAND CLUTCH.

driving in either direction. It is of the contracting band type, and the band 7 is supported diametrically opposite the split. The two free ends of the band are drawn together by the levers 13 13, whose ends are spread by a wedge (not shown) which slides in the hollow shaft and forces the adjustable pins 17 apart.

Mechanical Lubricator.

No. 822,900.—J. F. McCanna, of Chicago, Ill.

This is the well-known McCanna (or Mc-

Cord) lubricator, differing from the usual form only in that the pump eccentric shaft is driven by a ratchet and pawl instead of by the usual worm and wheel.

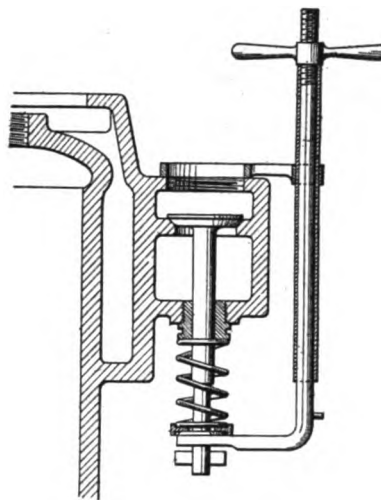
Detachable Tire.

No. 822,583.—James Christy, of Akron, Ohio.

This is a form of tire, having quick detachable flanges held on a flat rim by side clips secured by bolts passing transversely through the felly below the rim.

Tool for Removing Exhaust Valves.

No. 821,149.—G. J. E. Alphandéry, of Chaumont, France.

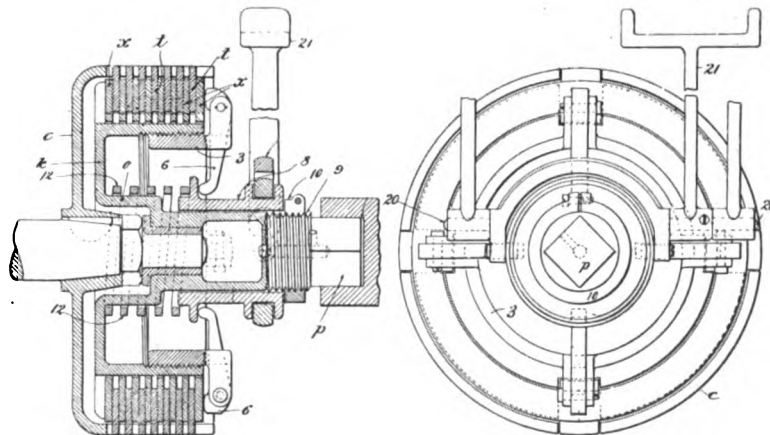


VALVE SPRING RELEASING TOOL.

This is a tool for compressing the exhaust valve spring to permit the easy removal, or the replacement, of the key in the exhaust valve stem. Its form and mode of operation are plainly shown in the drawing.

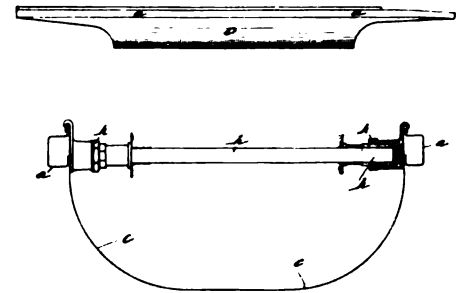
Automobile Frame.

No. 822,784.—J. Spyker, of Trompenburg, Netherlands.



MULTIPLE DISK CLUTCH WITH SELF-CONTAINED SPRING THRUST.

In this device a sheet steel pan *c* is provided under the motor and transmission members, which are suspended from the cross bars *h* in the manner shown in the lower view. The lower view shows dia-



ANTI-DUST BODY DESIGN.

grammatically the section of the channel member *a* of the main frame, also the provision at *k* for adjustment of the length of the cross members *h*.

Multiple Disk Clutch.

No. 822,727.—J. F. Duryea, of Springfield, Mass.

This is a clutch designed so that the spring thrust is self-contained when the clutch is in action. Alternate clutch disks *t* are tongued to revolve with the shell *c*, and the others *x* with the barrel *k*. This barrel has a hub *o* which is prolonged and threaded at *q* close to its squared end *p*. When the clutch is in action the spring 12 presses against the sleeve 8 and forces the dogs 6 against the disks. A special feature of the clutch is the adjustable stop nut 10, against which the sleeve 8 abuts when the clutch is engaged. The purpose of this is to limit the spring pressure which can be applied to the clutch disks, thereby allowing the clutch to slip when it is suddenly engaged, and pick up the load gradually. The force with which it presses the disks together may be adjusted by turning the ring 3. The clutch is released by moving the foot lever 21 in the direction of the arrow. It is fulcrumed at 20.

STEEL SPRING TIRE.

The ever-interesting tire problem has been attacked in a somewhat novel manner by Charles Adsit, of Owosso, Mich., and the accompanying illustration shows the device. The Adsit tire is not a pneumatic, but makes use of steel springs to obtain the requisite resiliency. The outer covering is of rubber and fabric, much like the shoe of a pneumatic tire, and fits closely over an arrangement of steel springs. A false rim of wood



ADSIT STEEL TIRE AND SECTION.

with a rubber facing strip on its periphery is secured to the rim of the wheel, inside the tire, in such a way that the rubber strip acts as a buffer and prevents excessive compression of the springs under abnormally heavy shocks. The illustration shows a wheel fitted with the Adsit tire with the rubber covering removed and one section of steel spring taken out; also a section of tire and rim, which shows the construction more in detail.

To each side of the false rim is bolted a series of semicircular steel springs. The outer ends of the springs, which do not quite meet in the center, are bent to the form shown in the section; the ends are inserted in deep grooves formed in the edges of a spring steel hoop which passes entirely around the tire. The semicircular springs and the rubber outer covering are bolted to the base of the false rim and the latter is, in turn, bolted to the rim of the wheel. The idea is that the steel spring hoop will have the effect of distributing the weight among a considerable number of the small springs, in which work the rubber covering will materially assist.

ACETYLENE BLOWPIPE.

The use of acetylene in place of hydrogen for producing high temperatures seems not to have received the attention it deserves. There are claimed for this new heating flame, says the *Electrical Review*, some important advantages, one of them, at least, being of considerable practical value.

The oxyacetylene flame corresponds exactly to the old oxyhydrogen flame, except of course that acetylene is substituted for the hydrogen. Oxygen is generally obtained from a supply under pressure. It is said that under suitable conditions temperatures as high as 4,000 degrees Centigrade may be reached—a temperature which is surpassed only by that of the electric arc. Combined with this increase in temperature, it is claimed that it is as controllable as the oxyhydrogen flame, and can be used as a reducing or oxidizing agent, or simply as a neutral heating flame.

An advantage of this new flame, which will appeal to the workman, is the ease with which the necessary gases can be transported and generated. The acetylene is, of course, obtained from calcium carbide in any of the many types of generators. A high pressure is not needed, and while up to the present time the oxygen has usually been drawn from a supply compressed into a cylinder, there are to-day available a number of chemical agents which will yield this gas simply upon being treated with water.

RECENT INCORPORATIONS.

Colonial Automobile Co., Philadelphia, Pa.; capital, \$25,000.

Cobe Auto Co., New York City; capital, \$5,000. Directors: A. J. Cobe, H. H. Cobe and H. G. Kosch.

United Auto Co., New York; capital, \$25,000. Directors: L. Ephraim, Henry Ephraim and Isaac Katzer.

Motor Car Livery Co., New York City; capital, \$1,000. Directors: J. M. Keyser, O. H. Brown and O. W. Trannel.

Shaw-Brown Motor Co., Buffalo, N. Y.; capital stock, \$15,000. Directors: Charles E. Shaw, Garnet G. Brown and William Hoddick.

Station American Automobile Co., New York; capital, \$2,000. Directors: D. H. Gaines, Clifford Longley and S. H. Jones, all of New York.

Mount Morris Garage, Incorporated, New York; capital, \$5,000. Directors: A. G. Ibbekin, F. W. Cattrell and M. H. Elser, all of New York.

Turner Motor Transfer and Trucking Co., New York; capital, \$100,000. Directors: W. F. R. Turner, F. H. McConn and W. W. Cantwell, all of New York.

Western Automobile Racing Association, Chicago; capital, \$2,000; promote speed trials. Incorporators: William D. Duval, Charles Weinfeld, Samuel A. Ettelson.

American Auto Company, Cleveland, O.; capital stock, \$30,000. Incorporators: C. C. Sigler, Alfred L. Brown, J. S. Maxwell, Alex. C. Mackenzie and Charles E. Carpenter.

Franco-American Auto and Supply Co., Chicago; to manufacture and deal in automobiles. Incorporators: William T. Church, Howard W. Lewis and Lloyd A. Wicks.

American Automobile Co., Cleveland, O.; capital stock, \$30,000. Incorporators: C. C. Sigler, Alfred L. Brown, J. S. Maxwell, Alexander C. Mackenzie and Charles E. Carpenter, of Cleveland.

Motor Vehicle Publishing Co., Ridgewood, N. J., publishers; capital, \$10,000. Incorporators: Milton C. Richardson, Frank R. Whit-

ten, Arthur A. Hill, James Sinton and Cornelius Doremus.

Knickerbocker Automobile Station Co., New York; to store and repair vehicles; capital, \$25,000. Incorporators: Herbert L. Constable, C. F. William Reiss, and Louis A. Fehr, all of New York.

Concord Motor Car Co., Concord, Mass., to manufacture, lease and operate automobiles; capital, \$10,000. President, John S. P. Alcott, Newton, Mass.; treasurer, F. Alcott Pratt, Concord, Mass.; clerk, John Edward Lavell, Boston.

Chesapeake Motor Car and Boat Co., Baltimore, Md.; capital stock, \$25,000. Incorporators: Fred W. Taylor, Compton Rely and T. Reginald Wise, of Baltimore, and H. Egerton Rely and Alexander Gorrecella, of New York.

Automobile Outing and Transportation Co., Baltimore, Md.; to buy, sell and hire automobiles and deal in automobile supplies; capital stock, \$50,000. Incorporators: Charles L. F. Harig, Reginald S. Ople, Lindsay C. Spencer, J. Q. H. Smith and Addison E. Mulliken.

THE GROWING GARAGE LIST.

H. G. Amick and Harold Davis will build a garage in Gallen, O.

The Morris Motor Car Co., of Morris, Ill., has opened a garage on Liberty street, under the management of Durley McKeen.

A new garage for the Holmes-Booth Automobile Co., of Cleveland, O., is being erected on East One Hundred and Fifth street.

A garage has been opened on Church street, Portsmouth, N. H., by R. H. Beacham & Son, proprietors of a livery stable.

A large building in course of erection in Raleigh, N. C., will be used partly for a livery stable and partly for a garage.

The first garage in Biloxi, Miss., is being erected by G. B. Elder & Co., of that place. Cars will be stored, repaired, sold and rented.

The Rambler Co., of Philadelphia, is having plans prepared for a three story brick garage, 40 by 100 feet, to be erected on North Broad street.

C. W. Hopkins, of San Francisco, has established a motorcycle and triar agency and garage at 729 Gough street, where he has erected a large new building.

J. W. Leavitt & Co., of San Francisco, have rebuilt their garage at 415 Golden Gate avenue, which was destroyed by the fire. This is one of the first garages to spring up from its own ashes.

The Rossiter Realty Company, of New York, has filed plans for a four-story garage to be erected at 147-151 West Forty-ninth street to run through to Fiftieth street. The cost will be about \$80,000.

The new garage of the Acme Garage Company, of Tacoma, Wash., is nearly finished. The garage will be the largest in the city, having a floor space of 75 by 100 feet, and has been specially constructed for automobile work. The arrangements will be modern throughout.

NEW STAGE LINES.

Plans are on foot for the establishment of an automobile stage line between Rutherfordton and Asheville, N. C., to give a service of two trips daily.

Members of the Cleveland, O., City Council are endeavoring to arrange for an automobile transportation service in the city parks, part of the cost to be borne by the city. The privilege of carrying passengers in the parks is usually let to contractors each season. A five cent fare is favored.

NEWS AND TRADE MISCELLANY.

W. E. Brown has bought the controlling interest in the Tippecanoe Automobile Company, of Lafayette, Ind.

L. P. Moores has been appointed chief designer and mechanical engineer of the Moon Motor Car Company, of St. Louis.

The first eight cars that finished in the recent Italian Golden Cup endurance contest were fitted with Truffault-Hartford shock absorbers.

The Chicago branch of the Firestone Tire and Rubber Company has been removed from 550 Wabash avenue to 1442 Michigan avenue.

One of the largest single orders ever placed for automobiles was that given the Electric Vehicle Company by the New York Transportation Company for 50 Columbia broughams for delivery next fall.

Recent Washington converts to automobiling include Senator Scott of West Virginia and Baron Moncheur, the Belgian ambassador, both of whom have placed orders for Columbia electric victoria-phætons.

The American Automobile Company, Baum street, East Pittsburg, will build on the site occupied by the structure which recently collapsed, a brick garage, to occupy the space of 80 x 115 feet, with a second floor to extend back 40 feet.

Three and a half acres of land adjoining the plant of the C. H. Blomstrom Motor Company, at Detroit, Mich., has been purchased by that concern as a site for extensive additions to its manufacturing plant.

At the recent meet of the North Jersey Automobile Club at the Hohokus track, Eddie Bald, in a Columbia 24-horsepower, stripped touring car, drove a five-mile exhibition in 6:50, which is said to be record time for a half mile circular course.

The Anderson Machine Company, of Bedford, Ind., is now at work on an auto that is planned especially for the rural carriers. It is of the runabout type, two cylinder, 12 horsepower, planetary transmission and will cost \$450.

The work of construction on the new factory of the White people on St. Clair avenue, Cleveland, is progressing rapidly. The walls of the factory building are up to the roof and the skylights are being laid. The buildings are of saw tooth construction, calling for glass skylights.

Commodore H. C. Roome has returned to northern waters with his yacht *Roamer*, and has gone in for automobiling. He has graduated from the runabout car, and has just purchased a 40-horsepower Lozier, which he is using at his summer home at Greenport, L. I.

T. F. Russell, who conducts an extensive manufacturing agents' business at 22-24 Lincoln street, Boston, has completed arrangements with the National Sales Corporation, of New York, to handle its line of Connecticut coils, Geecee storage batteries, "Soot Proof" plugs, and Dodge lubricators in Boston and surrounding territory.

A Maxwell-Briscoe touring car, driven by F. W. Peckham, of London, England, entered the recent Scottish reliability trials and came through with a clean score. The trip from London to Edinboro and return was made in 48 hours 16 minutes, running time, the distance being 800 miles for the round trip.

The handbook issued by the American Motor Car Manufacturers' Association gives illustrations and details of 77 different types of motor cars manufactured by the members of that organization. It also gives some interesting data regarding the association itself. Copies of the book can be had free by addressing the American Motor Car Manufacturers' Association, 29 West Forty-second street, New York.

In the issue of THE AUTOMOBILE of May 31, in the article describing the Kansas City Motor Car Company's new 6-cylinder car, it was stated that the works were located at Sheffield, Kansas. Sheffield is a suburb of Kansas City, and like Kansas City, is located in the State of Missouri.

An unusually heavy shipment of tires was recently sent by the Firestone Tire and Rubber Company, of Akron, Ohio, to the Ford Motor Company, of Detroit. The shipment consisted of a full carload of the new Firestone pneumatics, which will be used for the new Ford four-cylinder runabouts.

A special car conveyed 25 employees of the Detroit Auto Vehicle Company to Romeo, Mich., to witness the laying of the cornerstone of the new automobile factory which the company is building. The stone was laid by Miss M. E. Reid, the company's stenographer.

An involuntary petition has been filed against the Bender-Martin Company, No. 173 Lafayette place, New York City, by three creditors, the first claim being on assigned notes given to A. O. Baucker, amounting to \$11,200. The other claims are for small sums.

The Delaware Auto Storage and Repair Company, of Wilmington, Del., has enlarged its garage, at Eleventh and West streets, giving the company about twice the room it formerly had. Several other local garages have also been enlarged recently, the development of the business having encouraged those who have engaged in it.

The Four-Wheel Drive Wagon Company of Milwaukee, Wis., has delivered a 7-ton truck to the Council Bluffs & Omaha Transfer Company. This is the first big car of that nature in use in the region of Omaha, and it will make four trips daily between that city and Council Bluffs, hauling a 5-ton trailer.

H. R. Palmer, of Cleveland, O., claims to have perfected a motor using crude oil for fuel. The motor is a 20-horsepower, with 6-inch bore and 5-inch stroke. The moving parts of the cylinder are insulated from the combustion chamber and it is claimed that it is unnecessary to provide facilities for cooling either by air or water.

The new factory building for the Weston-Mott Company, at Flint, Mich., is nearing completion. The work on the walls has already been finished and the roof is now well under way. The Weston-Mott Company, which has operated for years at Utica, N. Y., will remove to Flint about the middle of July, and will give employment to about 225 men.

The manufacturers of the Fawkes Airless Clincher Motor Tire state that they have received many communications from users of the Fawkes tire, agreeing that the device is not only unpuncturable, but is as resilient as a pneumatic tire. The Fawkes tire has an inverted V-shaped core of soft rubber, the space being filled with air, though not under

pressure. The Fawkes tire is made by the Milwaukee Rubber Works, of Cudahy, Wis.

"Jack" Montgomery, manager of the local telephone office at Rensselaer, Ind., has been using an Orient buckboard in the work of keeping up his lines in the country district. He is able to reach the seat of trouble on any line in a short time, and to also inspect a large territory in the course of a working day. A touring party consisting of Mr. Montgomery, Delos Thompson, B. F. Fending, and Mr. Warren will make a tour in a White steamer from Rensselaer to Indianapolis, thence through the larger cities of central Ohio to Pittsburg, Pa., and will return home through northern Ohio and southern Michigan, stopping at Detroit.

PERSONAL TRADE MENTION.

Edmund Buchanan, a member of the firm of Callahan, Atkinson & Co., of Baltimore, has removed to New York, in which city he will henceforth make his residence.

John Milliken, formerly with the Electric Vehicle Company of Hartford, has become the general manager of the Automobile Outing & Transportation Company of Baltimore.

Hiram E. Weaver, proprietor of one of the leading garages of Portsmouth, N. H., has disposed of his business to accept a position with one of the leading Boston automobile houses.

George W. Browne, for the past two years with Holmes Schmidt Company, of Chicago, has joined the selling forces of C. A. Coey & Co., representatives of the Thomas Flyer in that city.

John E. Fry, formerly manager of the Chicago branch of the Apperson Brothers' Automobile Company, is now treasurer and general manager of the Consolidated Supply Company of Denver, Col.

J. L. Aikenhead, of New York, has succeeded A. E. Hoffman as manager of the Philadelphia branch of the Ford Motor Company. Mr. Aikenhead has for some time been connected with the New York branch, and his appointment is in the line of a well-deserved promotion.

Henry J. Hill, who has severed his connection with the Electric Vehicle Company of Hartford, was the recipient of a handsome 32d degree Masonic charm, which was presented to him by his associates June 9, the date upon which his resignation as master mechanic of the factory took effect. Mr. Hill has been connected with the Electric Vehicle Company for ten years, and was universally popular among his associates.

NEW AGENCIES ESTABLISHED.

The Pope-Toledo is now represented in Indianapolis by Frank A. Beck, 719-721 North Illinois street.

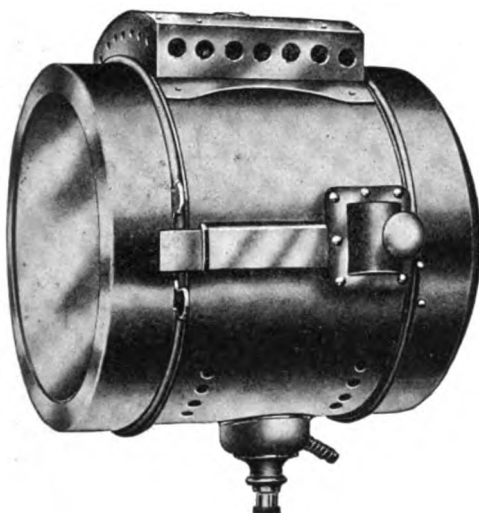
The Pope Motor Car Company, of Toledo, will hereafter be represented in Pittsburg, Pa., by the Auto Repair Company of that city.

The Gibson-Short Cycle & Auto Company, of Indianapolis, Ind., has completed arrangements for the agency for the Premier and Wayne cars.

The Porter-Cable Machine Company, of Syracuse, N. Y., manufacturers of automobile jacks, have contracted with Patterson, Gottfried & Hunter, of 146-150 Center street, New York, for the exclusive sale of their product.

LATE SPECIALTIES OF THE TRADE.

CONTINENTAL SEARCHLIGHTS.—Good lamps are an essential part of the equipment of every automobile, for going it blind at night is neither safe nor pleasant and poor lamps are very unsatisfactory things. A line of lamps intended to fill the demand for high-class articles is handled by the Motor Car Equipment Company, of 55 Warren street, New York. These lamps



CONTINENTAL GAS HEADLIGHT.

are fitted with Mangin mirror lenses, and they will project their light twelve hundred feet, it is stated. Two styles are made, one with a swivel bracket to be attached to the dashboard of the car and having a handle at the back to direct the beam of light in the desired direction, and the other arranged for a rigid fork support. The bodies are made of heavy brass, highly polished, with copper trimmings. These are known as the Continental lamps.

MONARCH RUNABOUT.—A number of important improvements have been made in designing the Monarch runabout, manufactured by the Monarch Motor Car Co., of Chicago. The single-cylinder air-cooled engine has been replaced by a double-cylinder horizontal air-cooled engine of 12 horsepower, driving through planetary transmission, propeller shaft and bevel gears to the live rear axle. The wheels are made either 28 inches or 32 inches in diameter, and are fitted with 3-inch tires instead of the 2 1-2-inch tires formerly used. Front wheels run on ball bearings and the rear axle on roller bearings. The spring arrangement used last year is retained, and consists of long side springs of the well-known type supplemented by inverted side springs, the lower springs carrying the engine and other mechanism and the body riding on the upper springs, so that the engine vibration is absorbed to a great extent before reaching the body. The body is of the piano-box type in the runabout, and is finished in black. Other styles of body are also built. The car is said to be capable of traveling 25 miles an hour.

AN AUTOMOBILE DICTIONARY.—Those who tour abroad or have occasion to read and translate matter relating to automobiles and automobiling published in French and German, should find of considerable value a little book of pocket size called "Krausz's Practical Automobile Dictionary," which has just been published by the Frederick A. Stokes Company, of New York. This gives in three parallel columns to each page

the English, French and German equivalents of terms commonly used in connection with automobiles, including, in addition to the strictly technical terms, words often employed in touring. The dictionary was compiled by Sigmund Krausz, manager of the foreign department of the H. H. Franklin Manufacturing Company, from information culled from technical publications, catalogues and sport reports, and was brought out to meet the difficulty of finding proper translations of technical motoring terms.

NEW SPARK PLUG.—These are days of progress in the matter of the details of automobile equipment, and that one-time troublesome member, the spark plug, has received its full share of attention. One of the latest designs is illustrated herewith, and is made by the Charter Manufacturing Company, of 303 Dearborn street, Chicago, Ill., under the name of the Charter spark plug. The main feature of the plug is the wing-nut which forms the upper section of the shell, and by which the parts are held together. Once the plug has been screwed



CHARTER MICA SPARK PLUG.

into the cylinder, a wrench is not necessary, for by unscrewing the wing-nut, which can easily be done by hand, the central insulated core, carrying the insulated electrode, can be withdrawn and cleaned, if necessary, or a new one can be inserted. The central sparking point does not change its position if the electrode is turned, so

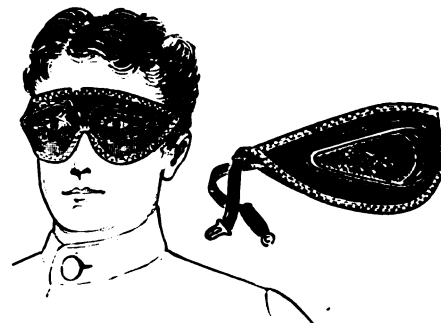


CHARTER PLUG TAKEN APART.

that the adjustment of the spark gap is not altered by successive removals and replacements. The shell and other metal parts of the plug are of polished brass, so that there is of course nothing to rust. The insulation is of mica, and is double. The inner layer is of strip mica wound on the central rod, while the outer layer consists of a large number of mica washers, forced over the mica winding by hydraulic pressure. The Charter plug is made with stand-

ard or metric thread, half inch size, and all parts are interchangeable. Joints are ground to fit and require no gaskets.

A GOOD GOGGLE.—In the accompanying illustration is shown a new idea in goggles for automobilists. These are called the Perfection goggles and are manufactured for Charles E. Miller, of 97 Reade street, New York. As may be seen, the glasses are of special elongated form, so as to give a view sideways, the glass being curved



MILLER'S PERFECTION GOGGLES.

to help in this direction. The frame is curved to fit the contour of the wearer's head, and is nickel-plated; the covering, which is large enough to protect the eyes without covering much of the face, is of kid, and may be had in a variety of colors. An elastic band of adjustable length holds the goggles on.

CATALOGUES RECEIVED.

REO MOTOR CAR COMPANY, LANSING, MICH.—Pamphlet of testimonials entitled "The Car That Does."

AUTOMOBILE BUYERS' ASSOCIATION, NEW YORK.—Catalogue of automobile accessories at very moderate prices.

RAPID MOTOR VEHICLE CO., PONTIAC, MICH.—Catalogue of gasoline commercial vehicles, with detailed description of chassis.

WARNER POLE AND TOP COMPANY, CINCINNATI.—Illustrated catalogue of automobile tops, lamp covers, tire cases and the like.

AUTO ACCESSORIES MANUFACTURING COMPANY, DETROIT, MICH.—Illustrated catalogue of a very complete line of automobile accessories.

PATTERSON, GOTTFRIED & HUNTER, LIMITED, NEW YORK.—Catalogue No. 60; a very complete catalogue of all kinds of bolts, nuts and screws.

BARRETT MANUFACTURING COMPANY, NEW YORK.—Handsome illustrated booklet describing Tarvia, a preparation for dust-laying and binding road surfaces.

ORLANDO F. WEBER COMPANY, CHICAGO.—Pamphlet embodying descriptions of the Pope automobiles and also describing the Weber service. This pamphlet is a novelty in its way.

PAGE-STORMS DROP FORGE CO., SPRINGFIELD, MASS.—Catalogue of drop forged wrenches and spanners; also crankshafts and other motor parts and a variety of special forgings.

DUFF MANUFACTURING COMPANY, PITTSBURGH, PA.—Illustrated catalogue of Duff roller bearing jacks for all classes of service. This concern also makes the well-known Barrett jacks.

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FINISH AND WINNERS OF THE HERKOMER

By W. F. BRADLEY.

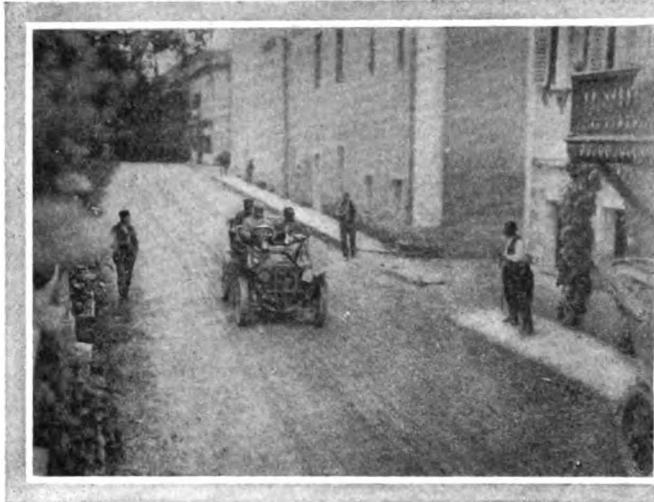
MUNICH, BAVARIA, June 14.—The Herkomer touring contest, which has just closed at Munich, after a distance of 1,000 miles, united no fewer than 133 starters, 90 of whom finished the tour. The first two stages of the tour were without important features, but as the cars advanced the roads became abominable and there was almost a competition among competitors anxious to apply to them appropriate adjectives. The first day's run, Frankfort to Munich, was over passable roads, and was covered in regulation time by nearly all the competitors. Only one accident occurred, a Benz machine turning turtle owing to taking a corner while running at too high a speed.

The 260 kilometers of the second stage, from Munich to Linz, brought the cars into romantically beautiful country, at one moment in deep valleys, at another climbing stiff hills with a muddy, greasy surface and a possibility of going into the ditch at any moment—an additional journey which not a few undertook. Racing tactics began at this early stage of the contest, though why drivers should have risked their machines and worn out their tires speeding in a contest taking no account of speed, it is difficult to understand.

From Linz to Vienna, 185 kilometers, the roads were in bad condition and a thick coating of mud adorned every car arriving



ROAD ON THE HERKOMER COURSE THAT CLIMBS THE SEMMERING HILL, IN BAVARIA.



DR. RUDOLPH STOEISS, 20-H.P. HORCH, FIRST PRIZE WINNER.

at the Austrian capital. On this stage Prince Henry of Prussia acted as policeman, taking the middle of the road, traveling at regulation speed and refusing to move to one side for the passage of scorchers. Protests were lodged, but the prince was ruled to have acted wisely.

After an exhibition at Vienna in which 115 cars were shown, many of them not having a penalty point against them, a move was made for Klagenfurt, 308 kilometers away. Of the 113 cars which started 105 reached Klagenfurt, a 90-horsepower De Dietrich coming in first and a 60-horsepower Mercedes second. It was on this stage that the Semmering hill was climbed and the adjectives thrown at the road. The nine kilometer hill climb with a flying start was covered by most of the competitors, though a few came to grief on the bends and on the day's run a larger number lost points. There were still, however, 102 cars fit to leave Klagenfurt for Innsbruck, 331 kilometers, and with the exception of an Itala which went into a wall, a Benz which visited the ditch, a Metallurgique which cut down a tree, and a small number that found the road too much for them, all reached Innsbruck.

Here the last stage, a 140 kilometer run to Munich, began. Ninety-eight machines started and all but three finished, not a bad proportion over a road which included the Zirberg, 1,000 meters high with an average grade of 7 per cent. and an occasional 27. Low gears came into play everywhere, and when the descent was made into Bavaria, accompanied by heavy rain, the owners of anti-skids considered themselves fortunate individuals. When passing through the Forstenrieder Park a 5,000 meter speed test was held, the individual performance of which did not offer much interest, as the results were based on cylinder capacity, and included in the general classification. All the time the rain de-



RED CROSS AMBULANCE THAT ACCOMPANIED THE RUN.

scended and accompanied the competitors into Munich, where a banquet and prize distribution brought the great German tour to an end.

How the Prizes Were Awarded.

After much discussion, verification of cylinders and endless figuring, the jury has drawn up and made public the results of the touring contest for the Herkomer cup. To the surprise of all a low powered car has triumphed over the 40 and 60-horsepower monsters, the cup going to Rudolph Stoess with an 18-20-horsepower Horch machine fitted with Continental tires. The Horch car has been constructed in the recently opened workshops of Herr Horch, an engineer for a long time with the Benz firm, at Zwitzau, in Saxony. The complete list is as follows:

1. Rudolph Stoess, 18-20-h.p. Horch.
2. Emile Neumier, 40-h.p. Benz.
3. Willy Poege, 60-h.p. Mercedes.
4. Henrich Opel, 20-h.p. Opel Darracq.
5. Carl Neumier, 40-h.p. Benz.
6. Weingand, 70-h.p. Mercedes.
7. Hyeronimus, 90-h.p. Mercedes.
8. Ladenberg, 70-h.p. Mercedes.
9. Uren, 24-h.p. Metallurgique.
10. A. Horch, 40-h.p. Horch.
11. Grigg, 35-45-h.p. English Daimler.

The classification for the Semmering hill climb is:

1. Willy Poege, 60-h.p. Mercedes.
2. Emile Neumier, 40-h.p. Benz.
3. Carl Neumier, 40-h.p. Benz.
4. Hyeronimus, 90-h.p. Mercedes.

The speed test in the Forstenrieder Park gave the following results:

1. Rudolph Stoess, 18-20-h.p. Horch.
2. Carl Westphal, 16-18-h.p. German-Standard.
3. Betzen, 18-20-h.p. Horch.

The elegance classification is as follows:

1. Eschebach (Benz).
2. Vandesleben (Adler).
3. Haase (Adler).
4. Livingston (Adler).

Winners of Herkomer gold medal:

- | | |
|---------------------------------------|---------------------------------|
| Percy Pierce (Pierce Arrow). | Spitzner (De Dietrich). |
| Miss Maud Manville (English Daimler). | Von Arco (Mercedes). |
| Grigg (English Daimler). | Baur (Diatto-Clément). |
| Haase (Adler). | Vandesleben (Adler). |
| Roth (Benz). | Weiss (Benz). |
| Dohmen (Benz). | Commerell (Mercedes). |
| Flinch (Mercedes). | Prince Henry of Prussia (Benz). |
| Wild (Mercedes). | Tischbein (Benz). |
| Dreher (Mercedes). | Beckmann (Darracq). |
| Juergens (Benz). | Wergel (Fiat). |
| Frankenburg (S. A. G.). | Schoemperten (S. A. G.). |
| Marchal (Renault). | Sorel (De Dietrich). |
| Branda (Darracq). | Eschebach (Benz). |
| Wilhelm (Opel-Darracq). | Milch (Fiat). |
| Turch (Benz). | Praunbeck (Benz). |
| Mathis (Fiat). | Von Tuede (Martini). |
| Uebel (Benz). | Haspachy (Mercedes). |
| Kaldi (Benz). | Goldschmidt (Pipe). |
| Hesselberger (English Daimler). | Euler (Argus). |
| Rehhardt (Metallurgique). | Mengers (Rekord). |
| Lord Montagu (English Daimler). | |



MISS MAUDE MANVILLE, 35-45 H.P. ENGLISH DAIMLER.

COMBINATION TOUR TO MEET GLIDDENISTS.

Gratified with the success of their recent three days' outing to Rye Beach, N. H., members of the Bay State Automobile Association, of Boston, are organizing another tour, on a more ambitious scale, to be carried out in connection with the finish of the Glidden tour and passing over the Rye Beach route. This will constitute the second annual tour of the Bay State Association. Leaving Boston on the morning of July 26, the tourists will journey to Rye Beach, where the Farragut House will be the stopping place for luncheon. Dinner will be taken at the Wentworth and the night will be spent there. On Friday, July 27, the run to Bretton Woods will be made so that the party will be on hand to greet the Glidden tourists when they arrive on the following day, Saturday.

Two days before the start of the Bostonians a large contingent of automobilists, organized by W. J. Morgan, will start from New York with the same destination in view. The night of July 24 will be spent at Hartford, Conn., and Boston will be reached next afternoon. After a night at the Somerset, where special arrangements will be made for the comfort of the travelers, the New York and Boston contingents will travel together to Bretton Woods via Rye Beach. From Boston on the tour will be under the management of the touring committee of the Bay State Automobile Association.

Saturday, Sunday, Monday and Tuesday, July 28, 29, 30 and 31, will be spent at Bretton Woods. Senator Morgan has arranged for a hill climb up Crawford Notch, to take place Monday and Tuesday. On Wednesday the trip will be resumed, Portland being the night stop for that day; and there the tourists will spend the following day, August 1. On Friday, August 3, the run to Boston will be made. The New York contingent will remain in Boston over night and take the road for home next morning, Saturday, August 4.

ALBANY A. C. ANNUAL TOUR.

Boston, June 25.—The members of the Albany Automobile Club, which is on its annual tour, reached Boston late Saturday afternoon and put up at their headquarters at the Hotel Thorndike. The club started from Albany Thursday morning in nineteen cars and the first day's run was to Rutland. Friday they continued through Vermont, traveling some very hilly and difficult roads, and reached Keene, N. H., the night stop that evening. Saturday morning an early start was made and the tourists traveled into Massachusetts, passing through Fitchburg and reaching historic Concord for luncheon. At that town they were met by members of the Bay State Automobile Association, who had been called together by President Speare on an impromptu run to welcome the visitors. The combined organizations came into Boston over the Paul Revere route during the afternoon.



DIRECTOR LEHMANN, A PROMINENT HERKOMER OFFICIAL.

The Albany tourists spent Sunday in this city and to-day started for home, stopping for the night at Springfield, and making the run to Albany through the Berkshires, Tuesday. Among those who are taking part in the run are: A. J. McClure, Fiat; K. F. Robinson, Columbia; J. B. Kelley, Franklin; J. B. Taylor, Locomobile; J. P. Randerson, Pierce; B. W. Burdick, Peerless; E. W. Leahy, Locomobile; I. Newell, Peerless; H. M. Simmons, Franklin; W. F. Connors, Knox; W. G. Reynolds, Franklin; F. W. Cox, Cadillac; M. Van Alstyne, Thomas; E. W. Battersham, Maxwell and H. Martin, Maxwell.

CHILDREN'S DAY IN BOSTON.

Boston, June 26.—To-day was the annual Children's Day of the Massachusetts Automobile Club. This day is very much like the Orphans' Days in other cities, only the club prefers to call it by a name of its own, because all the children who are taken on the outing are not orphans. Dr. W. S. Shrigley, of the club, had charge of the tour. About 200 children from three or four different institutions were taken for an outing to Hoo-sick-Whisick pond, a beautiful body of water in the Blue Hills park reservation, about ten miles from Boston, and the park commissioners co-operated in taking care of the children and giving them a good time. President Elliott C. Lee, of the club, acted as pacemaker for the run and no speeding was permitted. At the pond the children were given a luncheon and spent the rest of the time playing games and amusing themselves as they wished and as only children can.



TH. DREHER, A GOLD-MEDAL WINNER IN HIS MERCEDES.



HERKOMERITES JUST BEFORE LEAVING VIENNA.

DOING JAPAN BY AUTOMOBILE.

By this week's mail from the land of cherry blossoms and chrysanthemums came the photographs of touring scenes in that far-off island empire, published on this page. They were for-

Glidden have traveled 8,500 miles in their Napier car. They left Bombay, India, December 1, and visited Ceylon, Cochin China and China, and finished the season with a 1,122 mile trip in Japan, bringing the total distance to date 33,600 miles. Mr. Glidden

**THE MASSIVE ROYUBA GATEWAY.**

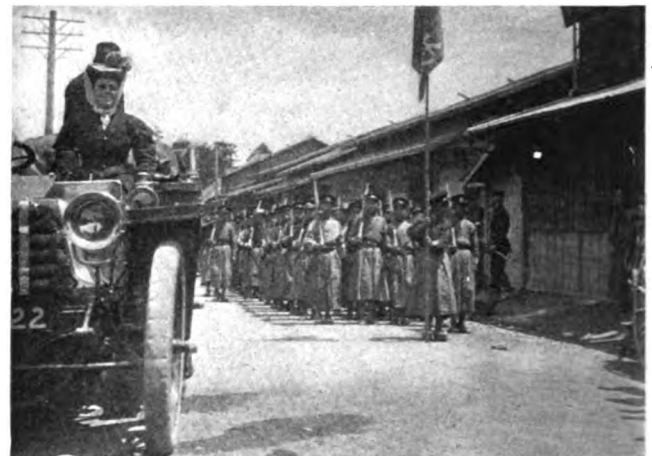
warded by Charles J. Glidden, America's automobile globe girdler, and donor of the Glidden trophy, who sailed from Yokohama

**A TYPICAL JAPANESE HOMESTEAD.**

found the scenery delightful in Japan, but the roads disappointing, as they are narrow, and were built originally for jinrikishas,

**JAPANESE STONE LANTERN BY THE ROAD.**

the early part of the present month and is due here about July 1. Since beginning the latest stage of the world tour, Mr. and Mrs.

**DRILLING "THE BOYS" FOR THE WAR OF 19—?**

their surfaces being unsuited to the heavy touring car. Mr. Glidden will, of course, enter the Glidden tour, July 12-26.

**VILLAGE STREET IN THE JAPANESE PROVINCES.****A THIRTY PER CENT GRADE WITH CURVES IN JAPAN.**

MATERIALS FOR AUTOMOBILE CONSTRUCTION*

By THOS. J. PAY, E.E.

A general in the field in considering how best to advance his forces against the opposition of a vigorous enemy; must, to win, take into account the facilities at his disposal; and, too, we may say, motor car engineers, to be successful, can scarcely afford to overlook at least three factors, viz:

(a) The requirements in view of the services to be rendered.

(b) The normal facilities.

(c) The relation between the normal facilities and the requirements. In other words:

$C = I \frac{1}{2} - I = 0$ if Mr. Engineer is to have no pioneer work to do.

That the motor car problem is anything but a zero equation is as plain as can be, nor may we be sure of either "a" or "b" of the equation as available assets in the column of known values.

In an *academic* way, to solve this problem is too simple to require any further elucidation, but in a motor car we must apply the solution, and, as one might readily appreciate, a very few "thank-you-marms" are enough to spill the academic solution in nearly every case.

If the wants of the dilemma are uncertain, and the facilities afforded are scant, naturally enough the results obtainable will also inhabit the land of uncertainty, as it were.

The situation may be, and probably is, further complicated, since in all sincerity the normal facilities are inadequate to cope with what might be called the abnormal demand.

In other words, *we want better materials than we are able to secure*, and what is more to the point, we want the better materials quicker than we can now secure the products that do obtain upon the market.

Where we are now able to secure inferior grades of Bessemer steel drop forgings in, say, four to eight months, we want nickel chrome-steel drop forgings in from four to eight weeks. Will we realize our wants? I predict, gentlemen, we surely will! for reasons quite as irresistible as a "Kansas cyclone."

In the first place, our wants are real, and, again, we can afford to pay for what we want because necessity from every point of view dictates our choice.

Drop Forging Requirements.

I mention drop forgings merely as an incident, for in all truth it is as difficult to procure other genera of material as it is to obtain drop forgings. Before we can figure upon quick deliveries, or, for that matter, slow deliveries of materials, a decision must be rendered settling the question of the requirements, a decision indeed likely to afford much room for reflection ere a conservative settlement of the question can be arrived at.

There are two classes of engineers to be taken into account in a matter of this sort, i.e., the "dog in the manger" class, promulgating methods for rendering it unprofitable for any one using materials of a quality superior to those used by themselves, and the class of engineers who stand for quality without respect to first cost, if the end just offers the means.

It is to the efforts of the latter class of engineers that we must look for advancement, and it is to them the purchaser of motor cars will turn in the future when in quest of quality.

Some two or three years ago, or maybe longer, when it dawned upon the minds of men that American roads and a display of ginger inherent in American motorists were a combination too strenuous by far for common metal to withstand, the canvass for better material started with a vim and a vividness marvelously gaining in headway ever since, until to-day, as we may say, half the mills in America are running overtime on motor car products, and the other half are awakening—like Rip Van Winkle

after his long sleep—to what is to them a startling condition, for when a motor car builder says he wants nickel chrome-steel for his crankshafts, he knows what he wants, and knows enough not to accept a cheaper substitute.

At first when the matter was broached to the mills, they laughed!—'twas a sardonic sidelong knowing grin—and they missed the matter with the further brief statement, "*Freak steel is not profitable to produce.*"

Krupp, Schneider, Bischoff, Palidi, Lemoine, and other foreign steelmongers believed it was profitable, and for a considerable time they maintained a practical monopoly as a result of their belief.

Varieties of American Alloy Steel.

In America, while alloy steel was a known quantity, its uses were few, excepting for guns, armor plate, and projectiles; nor was it supposed any one who could use carbon steel would employ the high grades of alloy steel at prices ranging from five to ten times more than the prevailing market for carbon steel products.

They overlooked a circumstance, for the material represents but a small fraction of the total cost. Moreover, if a task when performed will not stay done, it is a most annoying matter. If a car sells for, say, a dollar a pound, it may not be far from right to represent the material in the raw state as affording may be 12½ per cent. of the total selling price.

It matters not at all just what the material may cost, provided it is the quality of the material necessary for the purpose, and no cheaper grade of material will suffice.

As to what will suffice for a purpose, enough is to say the purchasers are the dictators. In other words, the moment some one fixes a higher level than the plane previously afforded, it is at that moment purchasers advance their standard, and clamor for what they want; in fact, what is reasonable for any one to demand, i.e., "the best that money can buy."

It would be nonsensical in the extreme to adopt any high-priced alloy steel product in motor car work if the strength and security resulting from what is known as machine steel are all the situation warrants.

The highest-priced material is oftentimes more inappropriate than the very cheapest product to be had, as, for illustration, a tool steel wrist pin at 80 cents per pound is as irresponsible as a "coon in a hennery," whereas, ordinary Bessemer steel, properly treated, might outlive the rest of the motor. In other words, the 80-cent steel is of no value at all in such a place, whereas the 2-cent steel would probably serve for a considerable period.

The right material, then, for the respective parts must be our persistent aim to secure, and it is believed the material should be the most readily obtainable and the lowest-priced product possible to employ with absolute safety.

No man is justified in attempting to deceive the purchasers of his product on any pretext whatsoever. Whereas, a man who tries to deceive himself can scarcely expect to reach heaven and not have a burnt odor about his person.

Material for Crankshafts.

It is deception pure and simple to use, say, nickel chrome-steel for crankshafts and cast bronze for axles. It is equally a deception to employ mild steel for crankshafts. The only question is, Does the engineer who adopts such material for such a place know it is not suitable? 'Tis hoped not.

It is not the purpose here to attempt to say what should be the qualities of the materials for the respective parts of motor cars. Moreover, it is a problem yet to be satisfactorily solved.

True, a car constructed wholly of nickel chrome-steel, for instance, would be unbreakable, but for many of the parts in the

*From a paper read before the Society of Automobile Engineers in New York.

make-up of the car it would be as "pearls to the swine." However, the tendency in the past has not made it possible for swine to bedeck themselves with pearls.

The exact qualifications of nickel chrome-steel for motor car work are diverse. In the first instance, nickel chrome-steel possesses all the advantages of nickel-steel, with none of the treacherous characteristics of the latter. And, again, nickel chrome-steel will afford any degree of tensile strength, from 80,000 to 250,000 pounds per square inch, with an elastic limit of from 80 to 90 per cent. of the tensile strength—one of the marked characteristics of the metal—and an elongation ranging between a maximum of 30 per cent. and a minimum of about 5 per cent., and using suitable grades of this remarkable product, all of these qualifications may be afforded from one single bar of steel, not at the hands of an expert of long training, but under the guidance of a man of ordinary talents if he will but carry out the methods known to effect these ends.

Use of Nickel Chrome-Steel.

Stress has been laid upon the use of nickel chrome-steel, not because it is without any doubt the very best genera of steel, but because it possesses positively good qualities, and may be had upon the market.

There are other grades of steel besides, but they are not so well known and are much more difficult to procure. Nevertheless, the qualities of some of the other genera of steel are very interesting indeed.

The influence of composition on steel is now receiving a great deal of attention at the hands of the steel men, and strange as it may seem, some of the old doctrines are in the "scrap heap."

Motor car engineers have proven themselves to be a persistent lot, and have gone right ahead demanding results whenever and wherever the occasion demanded.

As soon as it was discovered that a projectile would withstand shock stresses, the question of the composition of the same was quickly ascertained by motor car engineers, for to them the question of shock stresses is the one great problem.

It was found that chromium made up a large part of the desirable qualities in "projectiles," and that nickel steel alone as an "intensifier" would not suffice.

Chromium from 1-2 to 2 1-2 per cent. may be used in steel in conjunction with nickel or otherwise, and as an intensifier chromium ranks carbon, and besides hardening as does carbon, chromium prevents the crystalline formation so detrimental to strength and pliability.

Chromium is better in all probability than vanadium for these purposes, but there seems to be no impropriety in the use of both chromium and vanadium, with or without nickel.

Nickel, as is well known, possesses valuable properties, such as resisting the propagation of cracks. Nickel also tends to widen the range of shock-resisting qualities, but whatever nickel does to steel chromium does better, provided nickel remains as a component.

Vanadium may be extremely valuable in metal for motor cars, on account of its especial quality of increasing the ability of steel to resist fatigue.

What we are all afraid of is the future of the car, that is to say, we know a car will run for a month, or even a season, but will the continual shock and jar result ultimately in "metal fatigue"?

We know fatigue is bound to set in, in time, and to defer the evil day efforts are put forth to so compose the steel as to make it especially able to resist fatigue.

Vanadium, then, is a very important element, because it does give to steel further ability to resist fatigue, but it is not necessary to eliminate either nickel or chromium to use vanadium.

Components of Ordinary Steel.

In ordinary steel the components present are silicon, sulphur, phosphorus, and manganese, aside from iron.

The aim with steel is not to entirely eliminate these products,

but to so adjust the respective quantities present as to effect the best results, as for illustration: For a given adjustment of the manganese, the silicon component should be fixed to neutralize the ills of manganese.

Without taking time to more than mention the presence of these components—for their qualities are generally well appreciated—we may pass on to the further discussion of the influences of these components upon chromium, vanadium and other "intensifiers."

It has been found that a fine low phosphorous product with a nice adjustment of silicon and manganese, paying due respect to sulphur—which makes steel hot short—results in a product of great value by adding but a small amount of chromium and about 2 per cent. of nickel.

A metal of this sort is easily worked, not difficult to produce, and performs in service extremely well. There are foreign cars that have made a fine record for themselves that have not one single pound of what might be called standard nickel chrome-steel in their makeup, but these cars have nickel chrome-steel that is vastly superior to any purely nickel steel possible to produce.

Drop forgings of this low chrome product are easy to make and would answer all practical requirements, besides eliminating the chances of trouble likely to follow the use of ordinary carbon steel drop forgings for many important purposes.

It is not impossible, however, to procure drop forgings of medium chrome nickel steel, nor would it be desirable to substitute the low chrome variety in the important cases requiring great strength.

One guarantee purchasers of motor cars will have with the use of alloy steel of either the nickel chrome or some of the other genera, is the entire absence of weld, for to weld these products is, to say the least, a very difficult feat, although "Krupp" says 'tis not feasible.

Molybdenum and tungsten do not seem to be of more than nominal value as intensifiers in motor car metal, particularly molybdenum.

The use of these products in conjunction with chromium might be something to consider, but in the main, these components belong to the tool steel series, whereas nickel chrome-steel, as it is used in motor car practice, is not even a member of the tool steel family.

Practical Situation Complicated.

The practical situation is rather complicated when reference is had to alloy steel products, or, for the matter of that, all steel products, owing to a mass of fallacies set forth as presenting facts.

With so many components it is extremely difficult for even experts to arrive at correct conclusions, and again the "commercial" equation is a devilish imp to down.

To illustrate the situation more clearly it is to point out the versatility of good steel as against the lack of the same qualities in inferior products, yet, even so, the inferior product will show up with the luster of a bogus five-cent piece and the nerve of a brigand, in contrast with the modest mien of quality.

In so far as the steel vendors are concerned, they all claim to have a monopoly of quality, and they all employ every influence under the sun to land their products.

It is entirely up to the "automobile engineer," who must judge for himself, act on his own initiative, and in spite of every adverse influence employ the most appropriate products of all lands.

In the process of working alloy steel products, there are many things to consider, and it is in this zone of activity that the most trouble will be experienced ere alloy steel products will find their way as welcome lodgers in the storeroom of shops in general.

It will not be possible to discuss this phase of the situation at this time more than to say 'tis easy enough to work alloy steel products under certain conditions.

The cost of a car made of alloy steel would be very high in such a shop, whereas, in fact, the cost of a car with all important parts of nickel chrome-steel need not be prohibitive if only the steel is properly worked.

ESSENTIAL POINTS OF THE NEW JERSEY LAW

NUMBERS of automobilists are in the habit of indulging in their favorite sport on the fine roads of New Jersey, not only residents of the state, but automobilists from the neighboring states. The beautiful and varied scenery, the general excellence of the roads and the numerous spots of interest make many parts of New Jersey particularly suitable for day runs and short tours; but those whose journeys lead them into the mosquito state will do well to make themselves familiar with the provisions of the new automobile law which goes into effect on July 1. From many inquiries received it would appear that automobilists are not, as a rule, cognizant of the restrictions imposed by the Frelinghuysen measure, and the following excerpts will doubtless assist tourists in keeping on the right side of the law.

No changes have been made in the matter of fees. Cars up to 30 horsepower will be charged \$4 a year, \$3 for registration and \$1 for license to drive. If the horsepower is more than 30, the charge will be \$7, \$5 being for registration and \$2 for license to drive. Motorcycles will be charged \$1, and are not required to carry license tags, though cars must have four-inch numbers at front and rear. The age of drivers must be not less than sixteen years, two years younger than permitted by the old law.

A point that calls for special attention is that no licenses or registrations under the old law will be valid after the new law takes effect on July 1 next. It will cost the automobilist \$100 to use an old license after that date.

Construction and Equipment of Motor Vehicles.

3. Every motor vehicle must be equipped with a plainly audible signal trumpet. Penalty, fine \$10.

4. (1) Every automobile shall carry, during the period from one hour after sunset to one hour before sunrise, and whenever fog renders it impossible to see a long distance, at least two lighted lamps, showing white lights, visible at least two hundred and fifty feet in the direction toward which said automobile is proceeding, and shall also exhibit one red light visible in the reverse direction. Upon the fronts of the two aforesaid lamps showing white lights shall be displayed, in such a manner as to be plainly visible when such lamps are lighted, the number of the registration certificate issued as in this act provided, the same to be in Arabic numerals, not less than one inch in height. Penalty, fine \$10.

Restrictions on the Use of Tire Chains.

6. No motor vehicle shall be fitted with a chain when used upon gravel, macadam or other made roads, except upon natural dirt, asphalt, cobble, Belgian block, or vitrified brick pavements; provided, however, that tires may be fitted with a chain when used upon roads covered with a coating of at least one inch of snow or ice. Penalty, fine \$50.

7. Every motor vehicle must have devices to prevent excessive noise, annoying smoke and the escape of gas and steam, as well as the falling out of embers or residue from the fuel.

Motor Vehicle Registration and Regulation.

The fee allowed each agent for registration certificates so issued by him, and for every license so granted by him, shall be fixed by the inspector of motor vehicles, the same to be retained from the registration fee or the license fee paid to him; provided, however, that every registration and registration certificate and every license to drive motor vehicles may be revoked by the said commissioner of motor vehicles for a violation of any of the provisions of this act or on other reasonable grounds, after due notice in writing of such proposed revocation and the ground thereof, and if a driver of motor vehicles shall have had his license revoked, a new license granted to him within one year thereafter shall be void and of no effect unless it shall be granted by the said commissioner of motor vehicles in person; and if the registration or registration certificate of any motor vehicle shall have been revoked, a new registration made, or new registration certificate issued within one year thereafter shall be void and of no effect unless the new registration shall be made and the new certificate issued under the personal direction of the commissioner of motor vehicles.

The Operation of Motor Vehicles.

15. No person shall drive a motor vehicle, the owner of which vehicle shall not have complied with the provisions of this act concerning the proper registration and identification of the same (Penalty, \$100); nor shall any person drive a motor vehicle which shall display on the front or back thereof a fictitious number or a number other than that designated for such motor vehicle in the New Jersey registration certificate of such motor vehicle. Penalty, fine \$500 or imprisonment for sixty days.

16. (1) Every resident of this state who is the owner of an automobile, and every non-resident owner whose automobile shall be driven in this state, shall annually file in the office of the commis-

sioner of motor vehicles, or with the lawful agent of said commissioner, a statement in writing, containing the name and address of such owner, together with a brief description of the character of such automobile, including the name of the maker and the manufacturer's number of the automobile, if number there be, and the real horsepower of the automobile, and shall pay annually to the commissioner of motor vehicles, or his lawful agent, a registration fee of \$3 for each motor vehicle having a rating of less than 30 horsepower, and \$5 for each motor vehicle having a rating of 30 horsepower or more; and if an automobile has two ratings of horsepower the registration fee shall be based upon the highest rating. The commissioner of motor vehicles shall issue for each automobile so registered a certificate properly numbered, stating that such automobile is registered in accordance with this section, and shall cause the name of such owner, with his address, the number of his certificate, and the description of such automobile or automobiles, to be entered in alphabetical order of the owners' names in a book to be kept for that purpose; provided, however, that the commissioner of motor vehicles may refuse registration in the case of any automobile that shall not comply with the requirements of this act or that shall seem to him unsuitable for use on the public roads and highways of this state. Each owner having a residence outside of the state shall file with the secretary of state a duly executed instrument, constituting the secretary of state and his successors in office the true and lawful attorney upon whom all original process in any action or legal proceeding for damages, caused by the operation of his registered motor vehicle within this state, against such owner may be served, and therein shall agree that any original process against such owner shall be of the same force and effect as if served on such owner within this state; the service of such process shall be made by leaving a copy of the same in the office of the secretary of state with a service fee of \$2 to be taxed on the plaintiff's cost of suit. Said commissioner of motor vehicles shall forthwith notify such owner of such service by letter directed to him addressed at the post-office address stated in his application. Upon any and every transfer of a registered automobile by the owner thereof, in whose name the same is registered, the said registration and certificate thereof shall forthwith be and become void; but the same may be validated by the indorsement of the commissioner of motor vehicles, the purchaser having made written application therefor and paid a transfer fee of \$1. Every registration shall expire and the certificate thereof become void at the expiration of one year from the date thereof, subject to renewal by the commissioner of motor vehicles upon the filing of the proper statement and the payment of the registration fee by the owner of the automobile.

Provisions Affecting Automobile Dealers.

(3) Every manufacturer of or dealer in automobiles, instead of registering each automobile owned or controlled by him, may make application, as hereinbefore provided in this section, for a registration number, and the written statement, in addition to the matters hereinbefore contained, shall state that he is a manufacturer or dealer, as the case may be, and that he desires to use a single number for all automobiles owned or controlled by him; and thereupon the commissioner of motor vehicles, if satisfied of the facts stated in said application, shall issue a certificate, as hereinbefore set forth, assigning the same a number as hereinbefore set forth, which certificate shall contain the statement that the same is issued to the applicant as a manufacturer or dealer, as the case may be, and that one certificate shall cover and be valid for all automobiles owned or controlled by such manufacturer or dealer until sold or let for hire, or loaned for a period of not more than five successive days. All such automobiles shall be regarded as registered under such general number; provided, and if, in addition to the registration number displayed on the front and back of the car, as hereinbefore provided, there shall be added the letter "M," of equal size and prominence; and provided, further, that not more than five automobiles, owned or controlled by the same manufacturer or dealer in automobiles, shall be in operation at the same time under the same number. The fee for every such manufacturer's or dealer's certificate shall be \$20.

Old Licenses Invalid After July 1.

(4) No registration or registration certificate made or issued under any former act shall be valid after July 1, 1906. Penalty, \$100.

17. No person shall hereafter drive an automobile upon any public street, public road, or turnpike, public park or parkway, or public driveway or public highway in this state unless licensed to do so in accordance with the provisions of this act. Penalty, \$500 fine or imprisonment sixty days. No person under the age of sixteen years shall be licensed to drive automobiles, nor shall any person be licensed to drive automobiles until said person shall have passed a satisfactory examination as to his ability as an operator, which examination shall include a test of the knowledge on the part of said person of such portions of the mechanism of automobiles as is necessary in order to insure the safe operation of a vehicle of the kind or kinds indicated by the applicant. Licenses and the fees therefor shall be rated according to the horsepower of automobiles and shall be granted for the period of one year; and the license, for one year from the date thereof, shall entitle the licensee to drive any registered automobile of the class for which it is granted, or of a class of a smaller horsepower. Automobiles of a horsepower not exceeding one horsepower shall be rated Class 1, and in like manner the class of every automobile shall be determined by the number of horsepower of the vehicle, and the annual fee for a license to drive any automobile of a rating less than 30 horsepower shall be \$1, and to drive any automobile having a rating of 30 horsepower or more, shall be \$2, and if an automobile shall have two ratings of horsepower, the license fee shall be based upon the higher rating.

Learning to Operate an Automobile Under the New Law.

When an automobile driver, upon passing a satisfactory examination, shall have been once granted a license hereunder, no further examinations shall be required for a renewal of the said license, unless the commissioner of automobiles shall deem it necessary;

provided, however, it shall be lawful for the commissioner of motor vehicles at his discretion to issue to any person a written permit, under the hand and seal of said commissioner, allowing the said person, for the purpose of fitting himself to become a motor vehicle driver, to operate a motor vehicle for a specified period of not more than three weeks, while in company and under the supervision of a licensed motor vehicle driver; and such permit, under the hand and seal of the commissioner of motor vehicles, shall be sufficient license for the said person to operate a motor vehicle in this state during the period specified, while in the company of and under the control of a licensed motor vehicle driver of this state; and provided further, that the said person, as well as such licensed motor vehicle driver, shall be held accountable for all violations of this act committed by the said person while in the presence of such licensed motor vehicle driver.

Must Show Licenses at Request of Police.

18. Each license to drive an automobile shall specify the maximum horsepower of the automobile allowed to be driven thereunder, and shall have indorsed thereon in the proper handwriting of the licensee the name of the licensee; and said licensee when thereupon requested by any motor vehicle inspector or magistrate while in the performance of the duties of his office under this act, shall exhibit said license to said officer and write his name in the presence of said officer to the end that he may thereby determine the identity of said licensee. Penalty, fine \$10.

20. No person shall drive a motor vehicle without the consent of the owner. Penalty, fine \$500 or imprisonment sixty days.

Identification Marks of Motor Vehicles.

21. The owner of each and every automobile which shall be driven upon the public streets, public roads, turnpikes, parks, public parkways, public driveways or public highways in this state shall have the number of the registration certificate, issued as in this act provided, upon both the front and back of every automobile, stationary, in a conspicuous place, at least fifteen inches and not more than thirty-six inches above the level of the ground, kept clear and distinct and clear of grease, dust or other blurring matter, so as to be plainly visible at all times during daylight; such numbers to be separate Arabic numerals and not less than four inches in height, the strokes to be in width not less than one-half an inch; and there shall not be placed upon the front or rear of said vehicle any other numbers; and when the number of the registration certificate shall include a letter or letters, such letter or letters are to be not less than four inches in height and the strokes to be not less than one-half of an inch in width. Penalty, fine \$100.

Use of Roads and Highways by Automobiles.

22. (1) Drivers of motor vehicles, whether of burthen or pleasure, using any of the turnpikes or public roads in this state, when met by another motor vehicle, or by a carriage, sleigh, or sled, shall keep to the right, and when overtaken by another motor vehicle, carriage, sleigh or sled, they shall likewise keep to the right, so as in both cases to permit such motor vehicle, carriage, sleigh or sled, either met or overtaken, to pass uninterrupted. Penalty, fine, \$25.

(3) No person shall drive a motor vehicle upon any public street, public highway, public road, public parkway, turnpike or public driveway in this state in a race or on a bet or wager. Penalty, \$100 and license revoked.

Regulations Governing Speed in New Jersey.

(1) A speed of one mile in seven minutes upon the sharp curves of a street or highway, or when turning a corner, and a speed of one mile in four minutes at the junction or intersection of a prominent cross-road where such a street, road or highway passes through the open country. The term "open country" meaning where houses are an average more than one hundred feet apart.

(2) A speed of one mile in five minutes where such street or highway passes through the built-up portion of a city, town, township, borough or village where the houses are an average less than one hundred feet apart.

(3) A speed of one mile in four minutes within two hundred feet of any horse or other beast of draught or burden upon the same street or highway, provided, however, that such speed not exceeding twenty miles per hour, shall be lawful in the open country, as may be necessary in order to pass a vehicle traveling in the same direction, but the speed shall be diminished forthwith if necessary to comply with the provisions of this act.

(4) Elsewhere and except as otherwise provided in subdivisions one, two and three of this section a speed of one mile in three minutes, etc.

Consequences of Violations of the New Law.

(2) Any person arrested for a violation of the provisions of this act shall, upon demand for the magistrate hearing the complaint against said person, produce his license for inspection, and if said person shall fail to produce his license, or to give a satisfactory excuse for its non-introduction, he shall, in addition to any other penalties imposed by said magistrate, be subject to a fine of not more than twenty-five dollars.

35. Any person who shall be convicted of violating the provisions of this act shall be subject to a fine not exceeding one hundred dollars; in default of the payment of such fine there shall be imposed an imprisonment in the county jail for a period not exceeding ten days; provided, that any offender who shall be convicted of a second offense of the same violation may be fined in double the amount herein prescribed for the first offense, and may, in default of the payment thereof, be punished by imprisonment in the county jail for a period not exceeding twenty days; provided further, that the penalties above prescribed shall not apply to the display of a fictitious number.

Any person convicted of displaying a fictitious number, as prohibited by section fifteen, or of violating the provisions of sections seventeen, nineteen and twenty of this act, shall be subject to a fine not exceeding five hundred dollars, or to imprisonment in the county jail for a period not exceeding sixty days.

The city council of St. Paul, Minn., recently passed a resolution instructing the city engineer to raise the crosswalks two inches on certain streets to prevent fast automobiling.

TIRE TREADS RATED AS SOFT RUBBER.

WASHINGTON, D. C., June 25.—The Treasury Department has promulgated a decision of the Board of General Appraisers, wherein it was held that automobile tire treads are subject to duty at the rate of 30 per cent. *ad valorem* under the provisions of paragraph 449, of the tariff act of 1897. The appraiser returned the merchandise as vulcanized India rubber, and the collector of customs at New York assessed duty at the rate of 35 per cent. *ad valorem* under the provision, of paragraph 450 of the same act. The former paragraph provides for manufactures of India rubber, while paragraph 450 provides for manufactures of "vulcanized India rubber, known as 'hard rubber.'" The board held that it was not important to the determination of the issue that the rubber in question was only semivulcanized, as the board thought any process of vulcanization would be sufficient to take the product thereof out of paragraph 449, if the result thereof was hard rubber, but since, as in this case, the product is soft rubber, it seemed clear that the protesting importers had the best of the argument, and the board therefore sustained the protests and reversed the decisions of the collector. Reliquiations followed accordingly.

DULL TIMES IN FAR-FAMED LEICESTER.

The selectmen of Leicester, Mass., are having dull times this season as far as automobilists are concerned. Their coffers apparently are not as full as when Chief Quinn was really onto his job last season. The selectmen are now beginning to advertise under big headlines the following:

At a meeting of the selectmen June 12th it was voted:

That reckless driving or excessive speeding was not to be allowed in the town during 1906.

That we feel as liberally towards automobilists, as we tried to be last year in then raising the speed limit from 8 to 15 miles, and again raise the limit to 20 miles an hour for this year, with the exception of intersecting streets and curves, as provided for by state law.

That so long as a spirit of fairness is shown we shall meet them in the same spirit, but the laws must be respected.

TESTING VALIDITY OF ROAD LAW IN VERMONT.

MIDDLEBURY, VT., June 25.—The American Motor League has decided to test the validity of the action of the selectmen of Middlebury in posting the road from Rogers Corners to the Ripton line, against automobiles. F. R. Dickerman, of Bristol, a member of the league, accompanied by its attorney, W. H. Davis, of this place, made a trip over the forbidden road in an automobile. Before starting out the selectmen of Middlebury were notified that the trip would be made for the purpose of inducing the bringing of a test case, and that Mr. Dickerman would hold himself in readiness to respond to any action the town might take.

The American Motor League takes the position that the town having taken this action should either defend its position or recede from it, and that unless the town has a right to close this road, persons desiring to use automobiles upon it should not be intimidated by the posting of an illegal notice.

DRIP PANS IN PHILADELPHIA.

PHILADELPHIA, June 25.—On Saturday last Mayor Weaver attached his signature to the ordinance requiring all automobiles operated within the city limits to be equipped with drip pans, and also to that prohibiting the sounding of siren or Gabriel horns on the city streets. The ordinance repealing the local automobile law, which was introduced by request of the local automobile club officials, was pigeonholed in committee and will go over till next session of councils. There is no telling what its ultimate fate will be.

FRENCH INDUSTRIAL VEHICLE COMPETITION

By W. F. BRADLEY

PARIS, June 12.—A demonstration of commercial vehicles over a route from Paris through the important industrial centers to Tourcoing has been conducted in connection with the international exposition at Tourcoing by the Automobile Club of the North of France. Although spoken of as a competition, the event is more fittingly described as a demonstration, for the twenty-five vehicles engaged were divided into so many classes and were so dissimilar in construction that it is difficult to tabulate or compare their performances. The promoters, indeed, desire nothing more than to draw the attention of the industrial north to the value of mechanical transport and to give manufacturers an opportunity of watching commercial vehicles in action. In general the competition was similar to the one held by the Automobile Club of France last summer which resulted in the placing of many orders with the competing firms from both France and abroad.

The scene of the departure was at the Tuileries Gardens, as last year, and the country traversed was practically the same.

In the first class or division, for passenger vehicles carrying from twelve to twenty-four persons, there were two cars, a Delahaye 'bus and a handsome Bayard-Clément with open berline body, each weighing about 3 1-4 tons with full tanks. There were also two vehicles in the class for omnibuses carrying more than thirty passengers, one being the 32-40-horsepower Eugene Brillie similar to those adopted by the General Omnibus Company, and just put in service on the streets of Paris. This car, which can be run on either gasoline or alcohol, used the latter fuel. Its companion was one of the big Bayard-Clément cars with rear entrance body which the firm has but recently specialized.

The transport carrying classes commenced with tri-carriers carrying not less than 110 pounds load. There were six competitors, three Austral and three Contal vehicles. Both are single-cylinder, water-cooled machines with single chain drive, the Austral being run on gasoline and the Contal on alcohol.

Delivery vans carrying a load of from one to two tons were represented by a front-drive Latil, a Bayard-Clément and a Peugeot. All had two-cylinder motors and employed gasoline as fuel. The Latil car, a familiar figure in these competitions, carries its motor forward and drives through the front wheels. The Bayard-Clément drives through a propeller shaft to a live axle, and the Peugeot has side chains.

The class for vehicles carrying from two to three and a half tons embraced six competitors: an Auto-Camion, a front-driven Latil, a Louet & Badin, an Aries, an Achard (D'Espine Achard & Co.) and a Brillie. The Eugene Brillie and the Auto-Camion employed alcohol as fuel, all the others using gasoline.

The class for vehicles carrying three and a half tons had five starters, all with bodies especially constructed for some particular class of merchandise. A Eugene Brillie and a V. Janvier were run on alcohol; a Latil, a Prunel and a Peugeot used gasoline.

The Mors 'bus was given a class to itself, owing to its heavy body. The chassis was a 28-horsepower four-cylinder, with chain drive, the body being especially built for the Maggi Milk Company. It consisted of three separate compartments, two being entered by side doors and one by the rear, with ice channels between. The walls were double, about two inches thick. The body was suspended on four longitudinal, one rear transverse and two rear coil springs.



WEIGHING-IN OF THE INDUSTRIAL VEHICLES IN THE TUILERIES GARDENS, PARIS, BEFORE THE START.

MOTOR OMNIBUSES IN LONDON.

LONDON, June 12.—Between 400 and 500 self-propelled omnibuses are now regularly in use in the streets of London, and their number is increasing at the rate of ten or twelve every week. If the present ratio of increase continues, the end of 1907 should see the final substitution of motor 'buses for the slow horse traction in this particular branch of public passenger service.

The introduction of motor 'buses was long delayed; even at the end of 1904 there were only thirty in use; but last year there was



TYPICAL LONDON MOTOR BUS AT MARBLE ARCH.

a sudden awakening, and by the end of December there were 250 in active service. One hundred more were added to the number during the first three months of 1906. The sudden rush to secure vehicles for this purpose overwhelmed the few English companies engaged in building them, and consequently many orders were placed with French and German concerns and with small home builders. As a result, the number of British manufacturers is rapidly increasing.

Nearly all of the motor omnibuses are driven by gasoline engines. The largest number of any one make—160 at the end of last March—are of German manufacture, known as the Milnes-Daimler. Ninety others were made under German license by the English firm of Straker & Squire. The third largest number of one make were De Dion 'buses, built in France, and it was reported that the entire output of De Dion omnibus chassis for this year had been engaged by the London General Omnibus Company. Thirty other vehicles were built by Durkopp in Germany, while at the close of March there were ten steam 'buses built by Clarkson in operation and many more had been ordered. No electric vehicles of this type are used.

Thirty-four to thirty-six passengers can be accommodated in the later styles of 'buses, which are all of the double-deck type seating sixteen inside and eighteen on top. Police regulations forbid the carrying of a canopy top to shelter the passengers in the outside seats. The interior of the body is generally lighted by acetylene lamps supplied from a single generator carried outside.

The earlier 'buses were of about 24 horsepower, but the newer ones are commonly of 30-40 horsepower developed by four-cylinder motors. There is, of course, great variety in design, but the general tendencies are toward shaft drive to eliminate the noise of side chains, magneto ignition set to spark only at one position so as to dispense with timing. The engine is usually of the vertical type, located forward under a bonnet or directly under the operator's seat and footboard. In the Wolseley (English) 'buses of the new type brought out this year, the engine, instead of being horizontal as in the pleasure cars, is vertical. It develops 30 horsepower at 900 revolutions per minute. Sliding gears give four forward speeds and reverse. Side chains drive to the rear road wheels. The Leyland 'buses are the combined production of the Lancashire Steam Wagon Company and the makers of the well-known Crossley gas engine. They are driven by four-cylinder, vertical explosion motors of 22-30 horsepower at 800 to

1,000 revolutions. The frame is of channel steel and the drive by shaft to live rear axle.

Most of the London 'bus companies have adopted special names for their vehicles to distinguish them from those of the other companies, as, *Pioneer*, *Vanguard*, *Rapide*, *Arrow*, and the like, conveying the idea of priority or speed. One of the *Pioneer* 'buses is shown in the illustration of a London street scene. It was built by Scott, Stirling & Co., Ltd., of Twickenham, and is typical in general appearance of the 'buses in common use.

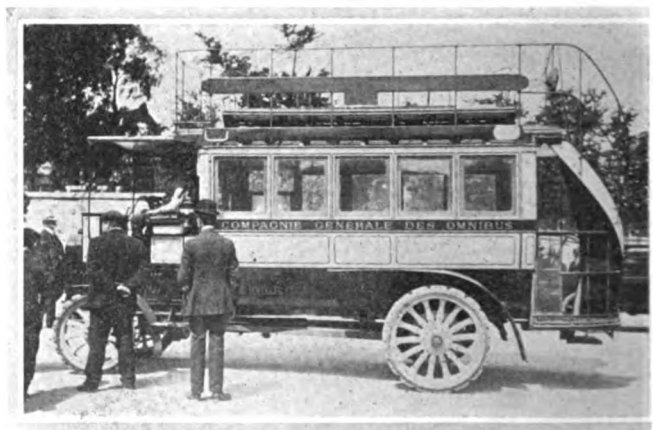
PARIS INAUGURATES ITS 'BUS LINES.

PARIS, June 8.—The placing on the Paris streets of the first motor omnibuses is a matter of some importance, made of still more moment by the delay in instituting the innovation. The high price of fuel in Paris and the uncertainty regarding the renewal of the monopoly enjoyed by the company now operating omnibuses are the causes responsible for the fact that the French capital is adopting the motor omnibus for its own use only after London had been overrun with such vehicles.

Two power 'bus lines have now been started, one extending east to west from the Hotel de Ville to the Porte Maillot and the other north and south from Montmartre to St. Germain des Pres. Fifteen 'buses will be used on the first route and seven on the other. This move is still regarded by the company as an experiment, although trials have been made with cars of nearly every important French make for more than a year. More changes from horses to motors are to be expected shortly, however.

The chassis of the 'buses now in use were supplied by Eugene Brillie and were constructed in the artillery works of Schneider & Co., at Le Creusot-Le Havre. They are of 32-40 horsepower, with four-cylinder engine placed under the driver's seat; transmission is by propeller shaft. The total weight of the 'bus, without passengers, is 9,614 pounds. The bodies are practically the same as those on the regular horse-drawn 'buses, except that a canopy has been placed over the seats on the upper deck.

Either gasoline or alcohol can be used for fuel, alcohol now being employed, although gasoline was used in the Salon trials. The carburetor is of the float-feed type with extra automatic air inlet and is heated by exhaust gases from the engine. The



BRILLIE 32-40 HORSEPOWER OMNIBUS IN PARIS STREET.

change-speed gives three speeds forward and reverse, manipulated by a single lever, and drive is direct on high speed. A live cross shaft carrying the differential has spur gears at its ends that engage with internal gears on the brake drums bolted to the rear road wheels.

Compactness and accessibility have been sought in designing these vehicles, and very little space is occupied by the engine. The gasoline tank, holding fourteen gallons, is under the driver's seat. The radiator, which is in front, has the water tank combined with it. Double block solid rubber tires are fitted to the wheels.

CATECHISM OF THE GASOLINE AUTOMOBILE*—IV

By FORREST R. JONES, M.E.

Q.—How many induction coils are used for a two-cylinder engine?

A.—Two, generally. A coil is provided for each cylinder, and a wire connects its high tension terminal to the spark plug in the cylinder.

In more unusual cases, however, only one induction coil is used, in which case it must have two binding posts for the terminals of the secondary winding. One spark plug is connected to one of the secondary binding posts of the coil and the other spark to the other high tension terminal of the coil. The path of the high tension current is then from one terminal of the high tension coil to its spark plug, thence across the air gap to the metal of the cylinder, through which it travels and jumps to the central wire of the other spark plug, and then goes back to the remaining terminal of the secondary coil. By this method of wiring a spark is produced twice as often in each cylinder as is necessary.

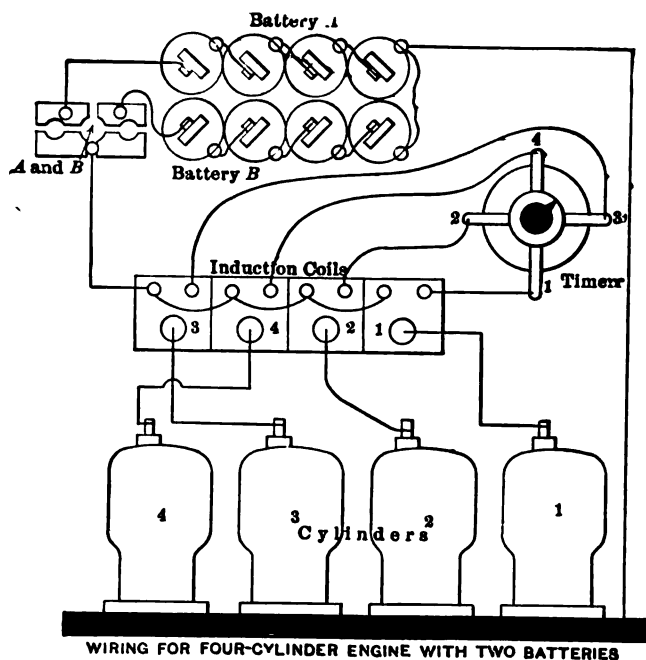


FIG. A

Q.—When four induction coils are used for a four-cylinder engine, how are the electrical connections made between the different pieces of the apparatus?

A.—The four coils (Fig. A) are usually placed in a box side by side. A wire leads from one terminal of the battery to the induction box, and connects to the terminals at one end of the primary winding of each induction coil. The remaining terminal of each primary winding is connected to its own contact piece on the timer, so that there are four wires between the timer and induction coil. The rotor of the timer closes the electric circuit through the four primary coils in succession, thus causing only one spark plug to operate at a time and at the proper instant.

Q.—What is the high-tension distributor system of jump spark ignition?

A.—It is a method by which only one induction coil is used for any number of cylinders. In some designs the rotor of the timer is placed on the same shaft as a metal distributing arm (or other device) so that they both rotate together at the same speed. For a four-cylinder engine the rotor of the

timer should close the primary circuit through the induction coil four times per revolution of the rotor at equal intervals. Each time the primary circuit is closed the distributor arm is brought opposite the terminal of a wire leading to one of the spark plugs so as to complete the electric circuit between that plug and the high tension coil. Since the distributor is brought opposite each terminal of the four spark plug coils in succession, a spark will be produced in each cylinder only when required.

In the distributor system the apparatus can be made very compact and all placed in one box except the battery and spark plug. Since only one induction coil is used, it must perform four times the service required of each coil by the system of ignition, using one coil for each cylinder in a four-cylinder engine.

Q.—What is the low tension (make-and-break) system of ignition?

A.—One in which a low tension current of electricity is interrupted by separating the contact points inside the combustion chamber so as to draw an electric arc sufficient to ignite the charge.

Q.—From what source may the current for low tension ignition be secured?

A.—Either from a battery or an electric generator (dynamo, magneto).

Q.—Is the electric battery satisfactory for constant service in low tension ignition?

A.—Not generally. The demand upon it for current is so great by most methods of using the low tension current that dry cells are soon run down or a storage battery soon needs recharging.

Low and High Tension Magnets.

Q.—Describe a low tension magneto.

A.—As the name indicates, magnets (permanent magnets) are used for a portion of the machine. These are generally U-shaped and three or four are used side by side. The free ends have pole pieces of soft iron or steel attached so as to leave an opening between them in which a cylindrical armature may turn. The armature is made up of disks of very soft iron, about which is wound, in a direction parallel to the axis of rotation, electrically insulated copper wires of several coils. The two ends of each coil connect to adjacent segments of a commutator of a form which may be made by cutting a ring of copper into several pieces by radial slots, then separating the pieces from each other by mica insulation and also separating them from the other metal parts of the machine with the same insulation. Each segment has a terminal from each of a pair of adjacent coils connected to it. When the armature rotates in the magnetic field between the pole pieces of the magnets, an electromotive force is generated in it, and a current of electricity may be taken from it by means of copper or carbon brushes resting upon the rotating commutator at diametrically opposite points. The voltage produced is proportionate to the speed of rotation of the armature, and the electric current is increased in about the same proportion for the kind of service under consideration. A governor is frequently applied to limit the speed at which the armature is driven so that the voltage will not become higher than is desirable.

Q.—Describe one form of mechanism for low tension ignition.

A.—A stationary rod or bar extends through the wall of the combustion chamber into the combustion space, and is electrically insulated from the metal of the cylinder by mica or porcelain. Another part also extends into the cylinder, but is not electrically insulated from it. It has a running fit in the hole it fills so that an arm attached to it inside the combustion chamber can be oscillated as a rocker arm both to bring it into contact

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with the insulated rod and to open the contact by the use of proper mechanism.

A spring is used outside the combustion chamber to hold the contact points together inside. When in operation the points are kept closed most of the time and an electric current from some source, such as a low tension magneto or a battery, flows through them.

An igniter cam or other device is attached to some rotating part of the engine so as to separate the contact points at the instant a charge is to be fired in the cylinder. The separation of the points draws an electric arc (single spark), which ignites the charge.

When a battery is used a "kick-coil" is placed in series with the circuit. The kick-coil has only one winding, which is of insulated heavy copper wire. The customary core of soft iron passes through the center of the coil. The kick-coil causes a longer and stronger arc to be drawn between the contact points.

Q.—What is a high tension magneto for jump-spark ignition?

A.—One that generates an electric pressure high enough to produce a jump spark across the spark gap of an ordinary spark plug without the aid of any auxiliary apparatus such as an induction coil or timer. In most forms it is a combination in one machine of a magneto and induction coil. Sometimes a condenser is also a part of the machine.

In one type the armature generates a moderate pressure which charges a condenser. The latter is then discharged through the primary of the induction coil which is part of the machine, thus producing a high tension current in the secondary. A high tension distributor is in circuit with the secondary of the induction coil, and its rotating arm is brought opposite one of the terminals to which a wire leading direct to the spark plug is attached. The discharge from the condenser through the primary coil occurs when the distributor arm is opposite the terminal of the wire leading to the spark plug. This occurs consecutively for all the spark plugs.

In another type the current from the low tension armature passes directly and intermittently through the primary of the induction coil so as to produce a high electromotive force in the secondary at the time a spark is required. The distributor arm is used in the same manner as previously described. The induction coil is a component part of the generator.

Forms of Friction Clutches.

Q.—What is a friction clutch and how used?

A.—A device for transmitting power in which the frictional resistance to the sliding of one smooth surface over another is utilized as the means of driving one part by another.

One part of the clutch is generally attached to the crankshaft of the engine and the mating part to a shaft which transmits power to the remainder of the transmission that connects to the driven wheels.

Q.—Why is a friction clutch adopted for this purpose?

A.—Because it is necessary to give a gasoline engine considerable speed of rotation before attempting to move the car by its power. This makes it necessary to have some means, as the friction clutch, by which the parts that are at rest can be gradually set into motion by the rapidly rotating shaft of the engine.

Q.—What is a cone friction clutch?

A.—One in which the contact surfaces (male and female) that transmit power by their frictional resistance to sliding are conical in shape (cone frusta). The parts are pressed together, generally by a spring.

Q.—What is a multiple-disk friction clutch?

A.—One in which a number of disks placed on concentric axes transmit power by the frictional resistance to sliding between their surfaces when pressed together. The ordinary type consists of two sets of flat metal disks, each set composed of alternate disks. Each disk lies between a pair of the other set. One set is attached to a shaft passing through their centers, and the other set to a sleeve or casing surrounding them. The disks are keyed so they must rotate with the part to which they are attached, but are free

to slide in the direction of the length of the shaft or thimble. The clutch is put into action by pressing the disks together, usually by a spring.

Q.—What advantage has a multiple-disk over a pair of flat surfaces rubbing together?

A.—If only one pair of friction surfaces were used to transmit a given amount of power at a given speed of rotation, the pressure between the rubbing surfaces would have to be much greater than when a number of disks of the same diameter and material are used. Thus if the number of rubbing surfaces is thirty the pressure required to hold the disks together for transmitting the power would be about 1-30 of that necessary for only one pair of rubbing surfaces of the same form and size.

Q.—What other forms of friction clutches are used?

A.—Those in which a band or outer part grips a rotating cylindrical piece, or an expanding cylindrical piece presses outward against a hollow part.

Q.—What materials are used for the rubbing surfaces of friction clutches?

A.—In the cone clutch the inner member is generally faced with leather which rubs against the smooth metal surface of the outer part; any metal may be used, but cast-iron and steel casting are more common. In a multiple-disk clutch steel on steel, steel on bronze, cast-iron on bronze, or metal rubbing against vulcanized wood fiber all give good service.

Q.—What is a positive clutch?

A.—One in which projections or jaws on one member fit into corresponding recesses of the other so that, when the jaws are brought into engagement, they must turn together without slip.

Change-Speed Gears.

Q.—What is a change-speed transmission gear?

A.—A number of gear wheels with teeth, generally inclosed in a case and placed just back of the friction clutch, which are used to give different speeds of travel to the car for a given speed of rotation of the engine. This is done by bringing different groups of gears into action for each speed of travel.

Q.—What is a sliding-gear change-speed transmission?

A.—One in which the different groups of gears of unequal diameters are brought into mesh by sliding one or more of the set along the shaft which supports it. The teeth of the gears are thus slipped between each other.

Q.—What is a planetary change-speed transmission?

A.—One in which some of the gears are supported on pins or short shafts which revolve around the main axis of the group. The same gears always remain in mesh with each other. Different sets are brought into action by stopping the rotation of one or the other of the parts which support the gears whose axes revolve around the main shaft. To stop the rotation of any part it may be gripped by a strap or band similar to a band brake.

Q.—What is an individual-clutch change-speed transmission?

A.—One in which the same gears are always in mesh, and different pairs or sets are brought into action by the use of a clutch which operates for that set of gears only. One clutch is provided for each set.

Q.—What is meant by direct drive?

A.—When the shaft connected to the rear member of the friction clutch is brought into direct engagement with the shaft which carries power to the wheels so that none of the change-speed gears are used for transmitting power. In many designs the change-speed gears revolve idly, however, when the direct drive is on.

Q.—What is the propeller shaft?

A.—The shaft extending from the change-speed gear box to a bevel gear which engages with its mate on the rear axle and transmits power to the latter.

Duly authorized chauffeurs holding permits will be allowed to drive automobiles through the Simplon Pass after notifying the gendarmes. The passage can only be made in the day time, and four and a half hours must be occupied in making the trip, the speed being checked by officials.

EQUIPMENT FOR A TOURING CAR

TOURING cars, when purchased new, are sold "fully equipped." This is a somewhat indefinite condition, as the equipment depends a good deal on the price of the machine, the highest priced cars usually being more completely fitted out than the lower priced machines; if any general distinction can be made, it is that the expensive cars are fitted with the essential attachments required in long-distance touring, while the cars selling at moderate prices are equipped with such articles as are absolutely needed for operation within the laws in daily use.

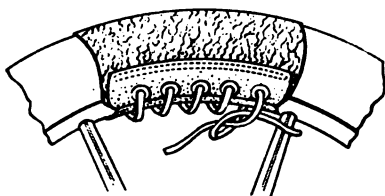


FIG. 1.—TIRE MANCHON OR SLEEVE.

It is the custom to sell new machines equipped with tires, a full set of gas headlights, generator, oil side lamps and tail lamp, horn, set of tools for adjustments and repairs, oil can, tire pump and tire repair outfit. Except in rare cases, the purchaser himself must buy such additional equipment for touring as the extension top with its storm curtains and boot, hampers or steamer trunk, fuel and oil funnels, lifting jack, distance and speed recording instrument, and various other articles. Of course, he has the top fitted before the car leaves the factory, but the other things are added as required. Many accessories that are offered in every automobile supply store are almost essential to the satisfactory use of a car, even for short runs in and about the city; others are found particularly useful in cross country driving where repair-shop and supply facilities are not to be depended upon, and many others are by no means indispensable but are in the nature of small refinements that the car owner may wish to have. The man who does much long-distance touring quickly

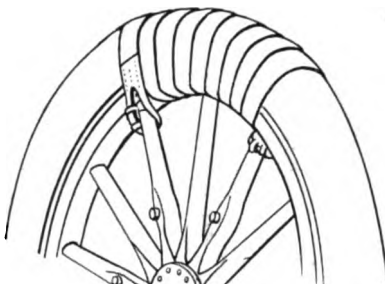


FIG. 2.—ELASTIC RUBBER TIRE BAND.

learns what can be dispensed with, and more slowly discovers the many small articles that may not often be wanted but which when wanted are most essential at the time and are found to be unobtainable unless carried in the car. In the latter class are usually to be placed such "spares" as extra valve sets, including springs and stem keys, cotter pins, nuts, bearing balls, copper gaskets, ignition cable, extra chain links and rivets, bolts, washer leather, asbestos packing, and so on.

An effort will be made here to mention briefly the articles that experience has shown to be most desirable in the full equipment of a car for daily use about town; in subsequent issues the accessories more especially adapted for touring and articles of clothing found needful or desirable will be treated.

Lap Robes and Rubber Aprons.

Assuming that the car as purchased

is equipped with the full set of lamps and generator, horn, simple repair tools and tire repair kit, the user is likely to discover early need for other protection against cold weather and rain than is afforded by the clothing worn. It is advisable, therefore, to carry in the car at all times one or two lap robes and rubber storm aprons. Changes of weather and storms come on suddenly, and even in a half-day's run one may catch a heavy cold by driving through raw and chilly air or may get soaked in an unexpected shower. Rubber rain aprons are made that extend over the whole seat of the car as well as the occupants, only the passengers' heads protruding, thus keeping the seat cushion dry—a very important point in the matter of comfort, as experience has proved.

Extra Tire Shoe and Tube.

Aside from minor engine troubles, the tires are more likely to give trouble than anything else. It is never safe to venture from the garage without a spare inner tube in the car. Spare tubes are sold packed in round or rectangular cardboard boxes, with plenty of French chalk sifted between the folds. If they cannot conveniently be kept in the original package, they should be removed and wrapped carefully in heavy cloth to protect them from injury by tools and by contact with grease and gasoline. As much as possible of the chalk should be retained, or more sprinkled between the folds to prevent the rubber cracking.

If a run of fifty miles or more is to be undertaken, it is best to carry an extra shoe, if there is any doubt whatever about the condition of any of the tires on the wheels. Waterproof oilcloth tire covers are made to be laced over the shoe to protect it against chafing, dirt and water, and these can be obtained at low prices. Special metal brackets are also made now to be screwed or bolted to the car on the operator's side or to be attached at the rear of the body for carrying an extra shoe. For temporary tire shoe repairs the pigskin tire-sleeve (Fig. 1) that laces over a cut or weakened place serves very well, while a newer device for the same purpose is the tire bandage, a band of very elastic rubber three inches wide and six feet long, with straps and buckles at the ends. This can be wound tightly around the shoe and buckled in place around a spoke while the tire is partially deflated, as in Fig. 2, and upon pumping up the tire it binds firmly in place and can be used for several hundred miles of driving if necessary. The band is very easily applied and will prevent a blow-out of the inner tube through a cut in the shoe.

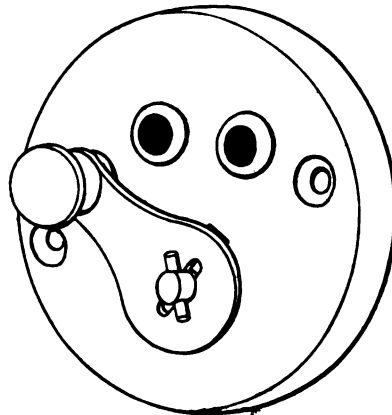


FIG. 5.—LOCK AND CUT-OUT SWITCH

Good Tire Pump Desirable.

Too often the tire pump furnished with the car is not all that could be desired. Pumps of many kinds and qualities are in the market, but for carrying in the toolbox of a car the straight plunger foot pump (Fig. 3), of good material and well

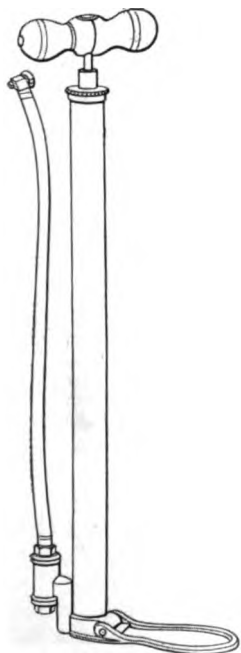


FIG. 3.—FOOT PUMP.

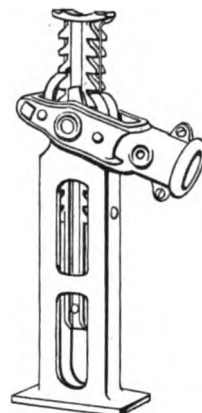


FIG. 4.—AUTO JACK.

made, will be found satisfactory. It should be substantial, with good connections and hose, and it is best to select one with a long barrel of small diameter, for an applied pressure of fifty pounds in a barrel one inch in diameter is just as effective as a pressure of 200 pounds in a barrel two inches in diameter; in other words, it is four times as hard to pump with the larger size.

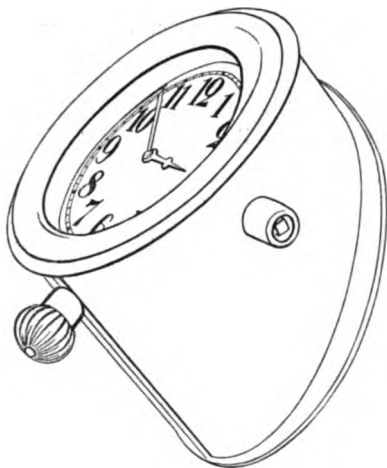


FIG. 6.—DASHBOARD CLOCK.

Selection of a Jack. The jack should be as much a part of the regular equipment of any machine as the tire repair kit, but it is seldom included in the equipment as the car is delivered from the factory. When it is omitted the owner can exercise his own judgment in making a choice. For serviceability the screw jack with ratchet lever cannot be excelled, but if there is reason for economizing in the matters of weight and space occupied, the light folding jacks may be preferred. In either case, it is important to see that the jack is sufficiently low to easily pass under either axle when the tires are deflated. A six-inch lift is sufficient for any purpose. Fig. 4 shows a jack which can be raised or lowered at will by working the same lever, a feature common to a number of jacks.

Lock-Switch for the Dash.

Meddlesome children and malicious persons of more mature years are so common in the city that it is customary to take precautions against the danger of having them start a car when the owner has left it unattended for a short time in the street. A common means of safeguarding it is to attach a lock-switch to the dash, if the one provided with the car is not of that type. This device is so made that the key can be removed and put in the pocket, thus making it impossible to close the ignition circuit. A simple form of lock-switch is shown in Fig. 5.

Dash Clock of Convenient Form.

Another attachment that is found of great convenience is a dash clock. Some of these clocks are mounted in an inclined polished brass case to be screwed to the dash and hold the face of the timepiece in the most convenient position for the driver to read, as in Fig. 6. These are made in both one-day and eight-day wind. They are commonly attached by concealed means, so that they cannot be readily removed by turning out a few screws.

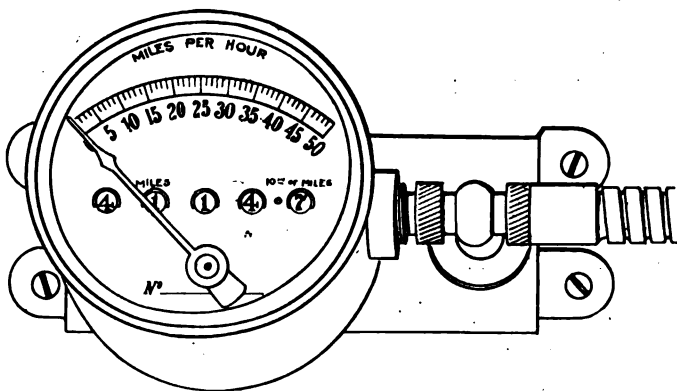


FIG. 7.—SPEED INDICATOR WITH CENTRIFUGAL MOVEMENT.

Vigilance of the police in cities and towns makes it de-

sirable to keep on the safe side of the speed laws, which accounts in large measure for the popularity of speed indicators. These are made in a dozen different styles and operate on several principles. One of the earliest and most used instruments (Fig. 7) operates on the principle of a centrifugal governor, the actuating mechanism revolving inside a circular case mounted in any convenient place on the dash and moving a pointer across a scale showing on the dial. The mechanism is driven by means of a flexible shaft connected by spur gearing with the hub of one of the front wheels of the car. Another type of speed indicator has a short vertical dial resembling a thermometer in which a minute column of colored alcohol rises and falls under the action of a small centrifugal pump driven by a spur gear on the road wheel, the alcohol flowing back gradually. No springs or weights are employed, and as the liquid does not dance up and down in the glass tube, its position can be read easily on the scale. A later form of speedometer (Fig. 8) is operated magnetically, the rotation of a circular magnet directly underneath a circular metallic dial tending to rotate the dial against the action of a delicate coil spring. The balance between the magnetic force and the spring tension determines the reading of the scale. The magnet is rotated by means of a flexible shaft driven by the front wheel of the car through the medium of spur gearing.

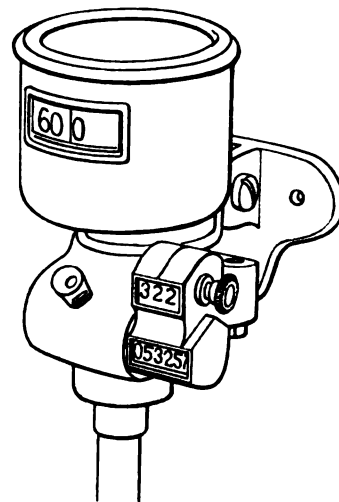


FIG. 8.—MAGNETIC SPEEDMETER.

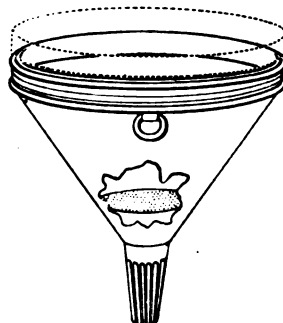


FIG. 9.—GASOLINE FUNNEL.

Distance Measuring Instruments. There is slight need of a distance measuring instrument on a car for strictly city use, but such advancement has been made in the manufacture of delicate instruments for recording the movements of an automobile that it is the common practice now to fit a machine with a combined cyclometer speed indicator. Generally the instruments of this nature are a combination of the well-known cyclometer with one of the foregoing types of speed indicating devices, as shown in Fig. 8.

Filling and Straining Funnel.

In the city use of a car there is not imperative need of fuel and oil funnels and a hydrometer, but it is well to have them, as they are very useful on runs of any length. There should be separate funnels for the gasoline and the lubricating oil, and it is well to use the former only for gasoline. Various forms of gasoline funnels are made and the buyer cannot go far wrong in making a selection. A convenient form is shown in Fig. 9. It has a gauze strainer just above the nozzle and a separate ring at the top with a shoulder and reduced portion adapted to fit inside the top of the

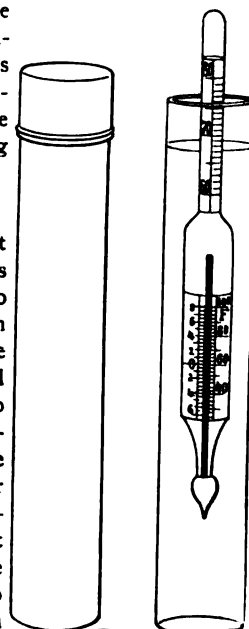


FIG. 10.—HYDROMETER.

funnel after a piece of chamois skin has been spread across it. The ring prevents the gasoline from splashing out or overflowing when it does not run through the chamois as rapidly as it is poured into the funnel. Careful operators make it a point always to strain through chamois all the gasoline that goes into the tank. Of course, common sense dic-

tates that the chamois must be kept clean and that if the same side is always placed downward when filling the tank whatever foreign matter is caught on the upper side one time will not be washed off the under side into the tank the succeeding time the chamois is used.

Hydrometer for Testing Fuel.

An engine does not work so well with stove gasoline of 68 degrees test or less as with gasoline of 76 degrees test, now commonly known as automobile gasoline. As it is a difficult matter to distinguish between them, however, a hydrometer is a useful instrument to carry in the car, so that when there is any doubt a test can be made. In Fig. 10 is shown a hydrometer especially provided for automobile use. It is graduated by the Baumé scale with a supplemental thermometer scale for making corrections for variations of temperature. The instrument is wrapped in a soft flannel pouch and packed in a glass test tube which fits inside of a nicked brass case with cap.

Volt-Ammeter for Battery Tests.

Batteries may run down at any time and anywhere, and although the ease of replacement in towns makes it less necessary to test them frequently, the man who stables his machine on his own premises will have use for a volt-ammeter. These are sometimes permanently attached to the dash of the car, but more often are carried separately in a leather case or chamois pocket. In Fig. 11 is shown such an instrument, made, like most of them, with a strong metal case, leaving only the scales and the end of the pointer visible under a glass face. The upper scale reads from 0 to 30 amperes and the lower scale from 0 to 6 volts. For dry batteries an ammeter with only one scale is used, reading up to 30 amperes. There are terminals at the lower side of the case for making connection with the battery. These are to be connected in short-circuit across the terminals of each cell in turn, using a very brief

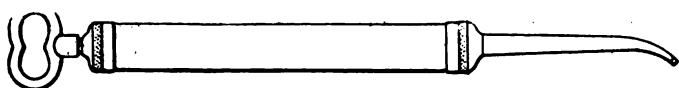


FIG. 13.—A SIMPLE OIL GUN OR INJECTOR.

contact—just long enough to get the reading, as the test is severe on the battery. A cell giving less than three to five amperes on short circuit has but a short useful life remaining. Secondary or storage batteries, which are used extensively for ignition purposes, are tested for voltage as well as amperage. A fully charged cell should show 2.25 volts, and when the voltage has dropped to 1.8 volts the cell

should be recharged. Two cells are tested in series, so that the voltmeter should read up to 5 volts.

Oil-Cans and Oil Guns.

Oil-cans and oil or grease guns should come with the regular equipment of tools with the car, but often they become battered or get lost and must be replaced. A very useful form of force oil-can is shown in Fig. 12. It is called a "railroad oiler," as it is of the type used by locomotive engineers. The long, tapering nozzle is most convenient in getting the oil to inaccessible places, and there is a small pump inside the can with a plunger above the handle where it can be pressed by the thumb to force oil through the nozzle when the can cannot be tilted to cause a flow by gravity. The pump valve can be removed for inspection and the nozzle can also be unscrewed.

An oil gun is useful for a variety of purposes. It can be used for injecting lubricating oil into unhandy bearings and also for washing out gummed and gritty bearings or cylinders with gasoline. A simple and substantial oil gun with removable nozzle is illustrated in Fig. 13.

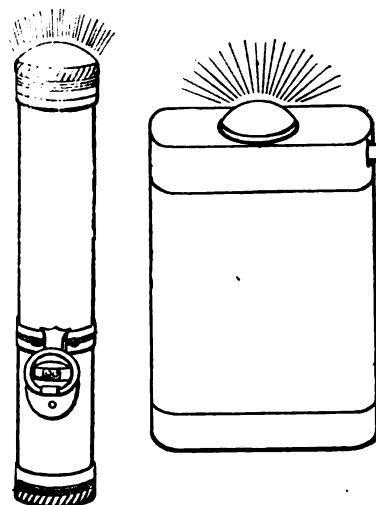


FIG. 14.—PORTABLE ELECTRIC LAMPS.

Portable Electric Lamps.

Frequently a minor adjustment or repair is necessary after nightfall where no lamp throws a light that is suitable to work by. It is both inconvenient and unsafe to remove one of the oil side lamps from the car to make an examination, and is still less satisfactory to use matches. For this purpose automobilists have found very useful the small portable electric lamps (Fig. 14) that are in the market. They are made in two forms, tubular and shaped like a flask to go in the pocket. Special dry batteries are made to fit them. At one end of the case is a tiny incandescent lamp bulb protected by glass, either plain or in the form of a lens. Pressure by the thumb on a button makes connection between the battery and the lamp, so that illumination can be had just when and as long as desired.

There are, of course, many other fittings and special accessories that have not been mentioned, but as most of them are especially suitable for use when touring, they will be treated in a separate article in a later issue.

ASBURY PARK AUTOMOBILE CARNIVAL.

ASBURY PARK, N. J., June 25.—William J. Morgan, of Newark, appeared before the beach commission at its meeting this week and made arrangements with that body for the use of the Arcade, one of the pavilions on the beach front, for Wednesday, August 22, through Saturday, the 25th, when he will hold his annual automobile carnival.

For two years past this event has been held at West End. In connection with the carnival the usual endurance tests, races and exhibit of cars will take place. Mr. Morgan also made arrangements to have Pryor's Band in attendance at the carnival.

Montreal has just discovered a law recently passed abrogating the right of the city to license automobiles. The fees for licenses already issued will have to be returned.

A FEW THINGS DRIVERS SHOULD KNOW

The Science of Creating an Artificial Draft.

The fan behind the radiator is usually driven by a belt. It draws a large volume of air through the cooler and discharges it partly through slits or "louvres" cut in the sides of the bonnet and partly backward under the dashboard. In cars fitted with clutches of small diameter, such as disk clutches or others of special types, the flywheel is sometimes made with fan-blade spokes, set to draw air backward. With this arrangement the radiator fan is sometimes omitted and the bonnet is made as nearly air-tight as possible, so that all the air drawn in by the flywheel fan must come through the radiator. With a cone clutch, or any clutch of large diameter, this cannot be done easily, for the space left free in the flywheel for fan blades would be too small for practical use. When the fan and flywheel spokes are used together to cause an air draft, the two must be so arranged that the flywheel fan will accelerate the current; if the spokes are set at such an angle as to retard the passage of the air, the effect will be inferior to that of a fan alone. And if the fan, when used alone, retards the flow of air when the car is running at high speed, the cooling effect will naturally be below the maximum obtainable under proper conditions.

As it is important that the driver should know that his water is circulating properly, some cars are fitted with "circulation indicators" attached to the dashboard. These are simply small-pressure gauges which show little pressure on the dial when the water is running, showing that everything is right. Another type of indicator consists of a little inclosed paddle-wheel with a glass front on its casing; the wheel revolves with the passage of the water.

In winter, when the water is liable to freeze and burst the water jackets, radiator, and make havoc generally, the pure water is replaced by some solution unaffected by low temperatures. A calcium chloride solution is commonly used for this purpose, but there are others that answer the purpose fully as effectively.

How to Adjust the Vibrator.

The correct adjustment of the vibrator on the coil is an important matter, not only from the fact that a better spark is produced when the adjustment is right, but also because the current consumption depends to a considerable extent upon the swing of the little spring. A good rough-and-ready rule for the novice is to set the "buzzer" so that it sings the highest note that it can sustain clearly and without harshness. This can be done by first screwing down the adjusting screw until the buzz is stopped. Then gradually turn back until a high, clear buzz, without rattle or hoarseness, is obtained. With dry batteries it is sometimes necessary to slack back the screw a little more as the cells run down. It is of course possible to set the vibrator so that it will work fairly well whether the battery is brand new or in the last stages of its usefulness, and a majority of coils are so adjusted; but to make a new adjustment, or to get the best work out of the coils, the above method may be followed.

High-Tension Current Easily Shortcircuited.

The high voltage of the secondary current of the ignition system makes it unnecessary to have a clear metallic path to cause a short circuit. A mysterious "short" in the secondary was, after weeks of theorizing without effect, traced to an oil-soaked rubber cloth hanger in front of the seat of the car. The current "shorted" across this to the frame of the car, frequently shocking the driver through the steering wheel and puzzling him sorely.

Revolving Cylinder Types of Air-Cooled Motors.

There is a group of air-cooled motors that do not depend on fans nor natural draught for cooling. These are the so-called revolving cylinder motors in which the crankshaft remains stationary while the cylinders, from three to five in number, rotate around it. A commercial form of engine of this type has the crankshaft set vertically and the cylinders rotating around it in a horizontal plane. Longitudinal ribs are cast on the exterior of the cylinders, and the rapid passage of the cylinders through the air keeps them quite as cool as is necessary. Engines of this class have also been made with the crankshaft horizontal and the cylinders moving in a vertical plane. A rotating cylinder engine affords a striking example of the relative cooling efficiencies of radiation and convection. After having run the engine rapidly for a time, and then quickly stopping it, the hand may be placed on the cylinder head flanges without discomfort; but ten seconds later the heat of the same spot would be unbearable. The reason is that while the cylinders are moving the air with which they come in contact is constantly changing and new volumes of cold are constantly available to take up the heat. When the cylinders are stationary, however, they are in contact with practically still air which rapidly becomes saturated, so to speak, and unable to absorb heat as fast as it passes from the interior to the exterior of the cylinder.

Beware the Treacherous Back Kick.

The unpleasant and sometimes painful consequences of a back kick when starting the motor are apt to make the automobilist rather shy of the crank for some time. There are some cars on the market with attachments which make it impossible to crank the motor with the ignition advanced, but where there is no such arrangement care must be taken to see that the ignition lever is placed in a position to retard the spark. And if the automobilist will take the trouble to learn to crank with his left hand instead of the right, he will probably avoid the consequences of his carelessness in case he forgets to retard the spark. When the left hand is used, a back kick seems to throw the hand and arm out of the path of the recoiling crank nearly every time. It is sometimes more difficult to get the knack of starting with the left hand, but it is well worth while to acquire the habit.

Cleansing Tire Covers of Spent Chalk.

French chalk within a tire cover should never be washed out, says the *Autocar* (Eng.). Some professional drivers are very fond of doing this, however, as it is an easy method of getting rid of it. But, like most proceedings that avoid trouble, it is a very undesirable thing to do, for the reason that it is seldom that sufficient time can be allowed to permit of thorough drying, and if there be any weak places in the fabric the moisture which penetrates them only serves to weaken them the more. The proper way to get rid of the spent French chalk from the interior of a cover is to brush it thoroughly with a stiff brush, and then rub the inner surface well with a clean cloth dipped in methylated spirit.

A Spark Plug Pointer.

It is a good thing for the novice to remember that the gap a spark will jump outside of the cylinder is by no means an indication of what it will do inside the cylinder in the middle of a highly compressed charge. A plug that will spark vigorously and hotly when tested outside of the cylinder in the usual way may refuse to spark at all at the critical time, or may pass such a weak spark that it will not ignite the mixture. To be effective the spark must be violent.

NATIONAL HIGHWAY COMMISSION ADVOCATED

WASHINGTON, D. C., June 25.—The latest aspirant for fame as a good roads advocate is Representative Rhodes, of Missouri, who has introduced a bill in Congress that will please automobilists in every section. It seeks to establish a national commission of public highways, the object and purpose of which is to cooperate with the several states and territories in the construction and improvement of the public roads, and to bring about as far as practicable a uniform system of construction and improvement of the public roads throughout the United States. The commission is to consist of three members, one of whom is to be appointed by the President of the United States, and who must have practical knowledge of road engineering and construction. He is to have a salary of \$5,000 a year. The other two members are to be the Secretary of Agriculture and the Postmaster-General. The latter is to be president of the commission, while the civilian member is to be the secretary.

The bill then goes on to provide that the legally constituted authorities of the several states and territories, under whose jurisdiction are placed the public roads, on having expended a given sum of money subsequent to January 1, 1907, in the establishment or improvement of the public roads of any state or territory, shall file in the office of the auditor of such state or territory a duly certified and authenticated statement of all money so expended. When any state or territory shall make application to the commission for national aid for the construction or improvement of its public roads, according to rules and regulations laid down by the commission, it shall be the duty of the commission to immediately appropriate a sum of money equal to the amount expended by such state or territory in the establishment or improvement of its public roads within twelve months prior to the date of the application. The sum appropriated to any one state or territory must not exceed \$500,000 in any one year after January 1, 1907.

For the purpose of carrying out the provisions of the bill the sum of \$50,000,000 is appropriated, to be available not to exceed \$25,000,000 a year during the years 1907 and 1908.

There are a number of good features about this bill that commend it to many members of Congress, and it is likely to receive a great deal of attention and consideration at their hands.

CONGRESSMAN SULZER'S STRONG PLEA.

WASHINGTON, D. C., June 23.—During the recent consideration of the sundry civil appropriation bill in the House of Representatives, Representative Sulzer, of New York, delivered a good roads speech that was considered a gem by his colleagues. He said he took an abiding interest in this all-absorbing question for better highways throughout the land by some plan of governmental assistance; that he was for the cause and in the fight to stay. He told the House that he had given this matter of national good highways careful study, and considerable investigation, and he believed it was one of the most important questions now before the American people. The appeal for good roads is a patriotic demand that comes from every section of the land, and Congressman Sulzer asserted that the time is at hand when the Congress of the United States must take up the matter seriously and legislate intelligently on the subject. The question will not down, he said, and it cannot much longer be ignored. The people want it, and what the people want they generally get. He called attention to what President Roosevelt recently said on this question, and he hoped ere long the President would send to Congress a special message urging that body to take some immediate and definite action regarding Government aid to good road building.

After pointing out how much money the Government annually appropriated for the army and navy, the rivers and harbors, the public buildings and grounds, for fortifications and coast de-

fenses, and other purposes, he said that in more than fifty years not a dollar had been appropriated by the Government for good roads. He declared the United States must build and possess good roads. The General Government must lend its aid to their construction. They must be free to all the people and stretching away in all directions throughout the length and breadth of the land. It is essential to our development. We are far behind the other great governments of the world in the construction and maintenance of good roads. Every person who has traveled abroad is at once impressed with this unfortunate fact. It is a reflection on our energy, a sad commentary on our sagacity, and a humiliating comparison with our progressive enterprise in every other field of endeavor.

LEGISLATION IN WASHINGTON STATE.

OLYMPIA, WASH., June 21.—State Highway Commissioner Joseph M. Snow has prepared a "state aid" highway bill, patterned after the New York law, which he will urge at the next session of the legislature. In brief, it is the purpose to have all roads built under expert supervision to the end that first-class and permanent highways may be secured. The bill provides for state aid for such highways and an abandonment of the past extravagant and wasteful outlays for the so-called "state roads." Past legislatures have appropriated large sums for such state roads. The last legislature switched a bit, and provided that a portion of the share should be borne by the county. The result has been that of the \$110,000 appropriation but \$2,000 has been expended. The county authorities have refused to make appropriations for their share, claiming the proposed roads were not of sufficient importance. Under the bill the counties may expend their money in their own way without scheme or system, but no state aid shall be rendered or they may place the road building for any particular highway or part of highway under the state as directed by the proposed law, and in that event the state will pay half of the cost of the road.

Considerable satisfaction has been expressed by the local automobilists over the act of congress in appropriating \$50,000 for the road to Mount Tacoma. The sum is to be expended entirely within the reservation, which commences about twenty-five miles from the snow line. The government has been working on this road for two years, and is now expending the last of a \$30,000 appropriation. To connect with the road being built by the government Pierce county will construct a highway through to the boundary of the reservation.

An automobile bill is in process of formation which contains some startling features, and which it is the intention to spring on the next legislature. The main features are holding the car liable for any fine that may be assessed against its driver, and that the license number shall be painted on the body of the car. It is proposed to make the fine a very heavy one, with \$100 as the minimum and \$1,000 as the maximum. This comes pretty near being "lunatic" legislation. The bill is undoubtedly the result of the recent flagrant violations of the existing state law.

There is hardly any question but that the next legislature will do something in automobile legislation, but it is doubtful if it will be of any such character. The present state law, which prevents municipalities from enacting automobile ordinances, is very unsatisfactory, and something new will undoubtedly take its place.

The Seattle automobilists are up in arms against County Commissioner Dan Abraham, who has placed four-inch planks across the Spokane avenue bridge, thus preventing driving faster than a walk. In doing this the commissioner has taken the law entirely into his own hands. It is true that there have been some very aggravating cases of fast driving in this city, and a number

of drivers have been brought into court and fined. It is probably due to the notoriety of these cases that has led Abraham to spoil one of the best drives in the city. It is also a case of short-sightedness, as the road is now in a somewhat dangerous condition. The county authorities will undoubtedly rescind Abraham's action, as it will be liable for damages in case any accident occurs that can be traced to the planks.

QUAKER CITY'S LATEST FRANCHISE SENSATION.

PHILADELPHIA, June 23.—City Solicitor Kinsey, who was asked for an opinion as to the legal status of the People's Vehicle Company, in the interest of which concern an ordinance was recently introduced into councils, asking for the exclusive privilege of operating automobile omnibuses over half a dozen routes, including many of the most prominent streets, has decided against the company. He finds that councils have no right to grant such an all-embracing franchise; that the state legislature alone has cognizance.

Thus has a quiet little steal been frustrated. But it is extremely doubtful that the snake would have been scotched had it not been for the fact that the Auto Transit Company, which had already taken out licenses to operate twenty vehicles, entered objections on the ground that the passage of the ordinance would not only drive it off Broad and Diamond streets, which had been selected for its first venture, but would keep it and any similar concern off those streets for twenty-five years to come.

And the Highway Committee of Councils had already reported the bill favorably, after a cursory examination, and mainly on the ground that the People's company offered a reduced rate to school children during specified hours. Indeed, the bill had been ordered printed when cries of "Grab!" began to be heard. It also developed that the franchises asked for would even block the Rapid Transit Company from several of the streets on the routes, and that made the committee sit up and take notice. Then it was that the city solicitor was called on for his opinion.

TOLEDO COUNCILMAN WANTS CAR FENDERS.

TOLEDO, O., June 23.—Councilman Leroux, of this city, has an original idea as to the needs of automobiles and of the best way to eliminate or reduce to the minimum all possibility of accidents. He has been working for some time past on an ordinance which he will shortly introduce into council which will require every machine to carry a net fender. His ordinance will also place the maximum speed limit at ten miles an hour and require that every machine have a registered number attached.

The idea of Councilman Leroux originated with the announcement made recently that a couple of Toledoans had invented a net fender for automobiles which, when not in use, can be so folded as to be almost hidden and not to take to exceed six inches in front of the machine. Control of the fender is secured through a series of springs which, when released by the foot, throws the fender into place.

NEW JERSEY'S ROAD REPAIR FUND.

Under the new Frelinghuysen law, the State of New Jersey has added up to date about \$11,000 to its treasury for the repairs of roads that have been injured by the passage of heavy cars equipped with chain and other treads on the tires. The revenue from the new registration law is to be used for the above purpose by the State Commissioner of Roads, who will proportion to each county the requisite amount of the fund required for the necessary repairs within the respective county limits.

Before the end of the year the Registration Bureau expects to collect \$65,000 in fees. This indicates a profit to the State, as it is hardly likely that it will cost that amount of money to repair the roads of New Jersey for damage done by automobiles in that period of time.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Tours.

- July 1-5.—Five Day Tour, Cleveland, O., to Mt. Clemens, Mich., Cleveland Automobile Club.
- July 10.—Buffalo, N. Y., Orphans' Day, Automobile Club of Buffalo.
- July 12-26.—Annual A. A. A. Tour, Chicago to Bretton Woods, N. H., Rules for the Glidden Trophy operative from Buffalo.
- July 24-Aug. 2.—New York to Boston and Bretton Woods, N. H., and return to Boston. (Will meet Glidden Tourists at Bretton Woods.) Entries with W. J. Morgan, New York, before July 20.
- July 26-Aug. 2.—Boston to Bretton Woods and Return, Bay State Automobile Association. (Will meet Glidden Tourists at Bretton Woods.)
- Aug. 22-25.—Asbury Park, N. J., Automobile Carnival.
- Sept.—500-Mile Endurance Test, Grand Rapids (Mich.) Automobile Club. (Date to be announced later.)
- Oct. 1-2.—St. Louis, Mo., Automobile Parade and Carnival. St. Louis Automobile Club.

Race Meets and Hill Climbs.

- June 30.—Race Meet, Belmont Track, Philadelphia Automobile Association. Entries to R. M. Lacock, Turf Club, 1421 Walnut street, Philadelphia.
- July 4.—Race Meet, Newark, N. J., Waverly Track, New Jersey Automobile and Motor Club.
- July 3-4.—Chicago Harlem Track, Race Meet, Western Automobile Racing Association.
- July 4.—Wilmington, N. C., Races at Wrights Mill Beach, Wilmington Automobile Club.
- Sept.—200-Mile Road Race, for the Farson Cup, Chicago Automobile Club. (Date and course to be announced.)
- Sept. 2.—100-Mile Road Race, on 25-Mile Circuit in Monroe County, N. Y. Rochester Automobile Club and New York State Automobile Association.
- Sept. 22.—American Elimination Trials for Vanderbilt Cup Race. (Long Island Course probably.)
- Oct. 6.—Vanderbilt Cup Race American Automobile Association.

Motorcycle Tours and Contests.

- July 3-7.—Annual Endurance Run and Meet, Federation American Motorcyclists, Rochester, N. Y.
- July 4.—Tour to Rochester, N. Y., New York Motorcycle Club.

FOREIGN.

Shows.

- Sept. 1-8.—Canada International Exhibition. St. John. New Brunswick.
- Oct. 5-14.—Leipzig (Germany) Exhibition, Krystall Palast.
- Nov. 1.—New Zealand International Exhibition opens at Christchurch.
- Nov. 1-16.—Berlin (Germany) Automobile Exhibition.
- Nov. 15-24.—London, Olympia Motor Show.
- Nov. 23-Dec. 1.—London, Stanley Show, Agricultural Hall.

Races, Etc.

- July 8.—International Cup Race for Motorcyclists, Cesky Club Motorcyclists of Austria.
- July 15.—Suse-Mont Cenis Hill Climb (Italy). Automobile Club of Turin.
- Aug. 1-15.—Circuit des Ardennes (Belgium).
- Aug. 9-12.—Malchamps (France) Hill Climb Tests.
- Aug. 15-16.—Ventoux (France) Automobile Meeting.
- Aug. 14-19.—Ostend (Belgium) Meet.
- Aug. 18.—Liedekerke Cup Race.
- Aug. 23.—Semmering Hill Climb.
- Aug. 27-Sept. 2.—Brescia (Italy) Automobile Meeting.
- Sept. 3.—Auvergne Cup Race, France.
- Sept. 27.—Tourist Race, Isle of Man, A. C. of Great Britain.
- Oct. 7.—Chateau Thierry (France) Hill Climb.
- Oct. 23.—Gallion (France) Hill Climb.

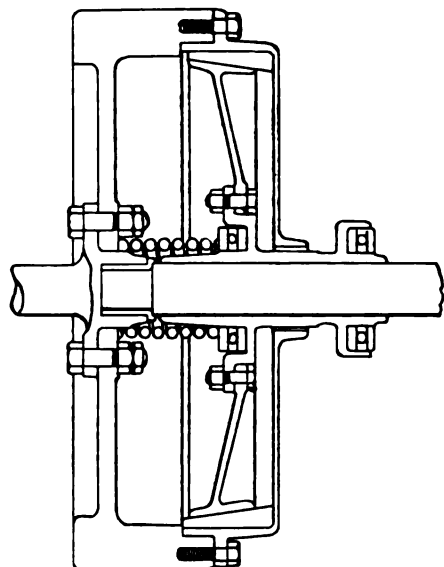
Motor Boat Races.

- June 28-29.—Kiel (Germany) Motor Boat Races.
- July 1.—Maison Lafitte (France) Motor Boat Races.
- July 8.—Le Coupé Dubonnet (France) Motor Boat Races.
- Aug. 6.—Motor Boat Race on the Rhone (France).
- Aug. 9.—British International Cup Motor Boat Race.
- Aug. 20-23.—Ostende (Belgium) Motor Boat Races. Dover to Ostende.
- Sept. 16.—Juvisy (France) Motor Boat Meeting.

FRICION CLUTCHES AND THEIR FUNCTIONS.—I

BECAUSE the gasoline engine of an automobile must be allowed to run free—that is, without propelling the car—at certain times when it is not convenient or practicable to place the transmission gears in the neutral or non-driving position, a device known as a clutch is employed. The clutch consists of two members adapted to be pressed against each

other so as to cause great friction. One of these members is carried on the rear end of the engine shaft, usually attached to or forming part of the flywheel, while the other is mounted on the forward end of a short shaft, known as the clutch shaft, which extends from the clutch to the gearbox. This refers to cars of the conventional motor-in-front type with a sliding gear transmission to the rear of the motor. Where a trans-



CONE AND SPLIT-RING CLUTCH.

mission of the planetary type is used the clutch is combined with the transmission, and this is also true of the individual clutch transmission, though even with these devices a clutch between the motor and transmission is sometimes fitted, when it is called the master clutch.

Referring to the four-cylinder car, the problem to be solved is to provide a clutch between the motor and the transmission that can be readily manipulated by the driver of the car, that will take up the drive gradually and smoothly, without "jerk-ing the car out from under the passengers," but that will hold firmly and transmit the maximum power of the motor when fully engaged. As a positive clutch or locking device, such, for instance, as a square shaft-end engaging in a square hole in the driven shaft, would be useless because it would take up the drive with a sudden jerk, friction is called into play, and all modern clutches used for starting the car consist of two friction surfaces, or sets of surfaces, pressed together by a spring or springs.

Construction of the Ordinary Cone Clutch.

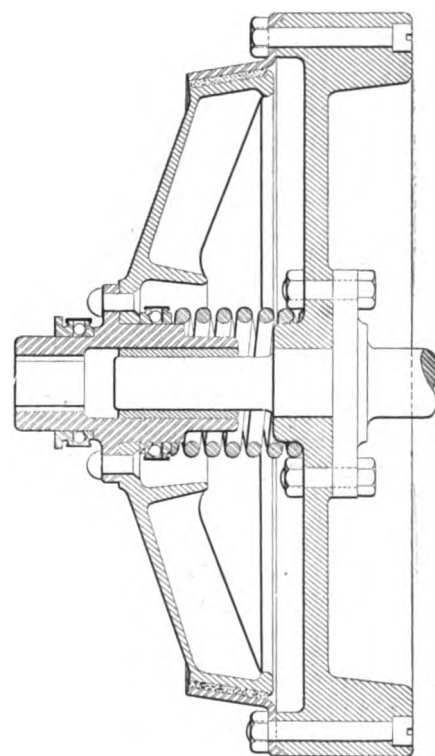
The most commonly used clutch is the cone clutch, a type that has been used ever since automobiles came into use. In the ordinary cone clutch there is a recess formed in the flywheel of the rear side, and this recess is bored out tapering, the largest diameter outside. In some cases a casting of the requisite form is bolted to the wheel. The cone, so-called, is mounted on the end of the shaft to be driven, the hub of the cone sliding back and forth on the end of the shaft, but being forced to turn with the shaft by a feather or key, or else by having the end of the shaft squared and the hole in the hub squared to correspond. It will readily be seen that if the cone is slid on its shaft until it enters the tapered recess in the flywheel, and is forced into the recess with the requisite pressure, sufficient friction will be set up to transmit the turning effort of the engine to the driven shaft. The cone is slid on its shaft by means of a collar and fork arrangement. A collar formed integral with or attached to the hub of the cone

is deeply grooved, and the ends of a fork project into the groove. By moving the fork back and forth, the cone can be moved whether it is turning or not; the fork is pivoted and is actuated by a pedal on the footboard. But it would be impossible for the driver to hold the clutch in engagement with his foot all the time the car was running, so a strong helical spring is used to press the cone home, the back end of the spring abutting against a collar or its equivalent fixed on the shaft. Thus the clutch is normally kept in engagement, the driver being required to exert himself only when it is necessary to withdraw the cone, when he presses or pushes forward the pedal and keeps his foot on it as long as he wants to keep the cone out. He can, when stopping the car, throw his change-speed gears into neutral position, and then let in his clutch without driving anything but the short section of shaft, usually called the clutch shaft, between the clutch and the gearbox.

The exact angle of the tapered parts is of the utmost importance because if the taper is too slight the cone will seize fast as soon as it is let in and, wedging into the recess, start the car with a sudden jerk that is not only very disconcerting to the occupants, but exceedingly hard on the engine and the power transmitting mechanism. But if the taper is too abrupt the clutch will slip excessively and will not hold securely. The cone is usually covered with leather to make its engagement smooth and to give a good grip; and the leather is often backed by springs, so that when the cone is gradually allowed to enter the recess the leather facing is at first pressed against the tapered bore and the friction is just sufficient to start the car gradually. When the clutch is allowed to go fully into engagement the springs are compressed into recesses.

The Reversed Cone Clutch.

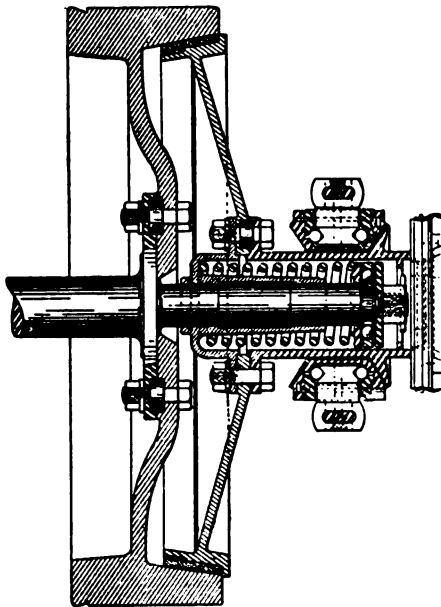
The form of the cone clutch is often varied by reversing the cone, making what is known as a reversed cone clutch. In this the internal cone is formed in a casting bolted to the flywheel, and the taper has its smallest diameter to the rear—the reverse of the previous arrangement. The cone is between



REVERSED CONE CLUTCH.

the face of the flywheel and the internal member, and moves away from the flywheel when let in. The helical spring is placed between the wheel and the cone. One advantage of this arrangement is that when the clutch is engaged there is no end thrust on any of the bearings, as there is with most types of plain cone clutches.

The arrangements described are of the simplest type, and many of the details are varied in order to obtain minor advantages. For instance, the single helical spring on the shaft is sometimes omitted and two or more springs carried on studs parallel to the shaft. It is a common practice where cone clutches are used to employ ball bearings to take the thrust of the clutch spring when compressed by the



[TYPICAL LEATHER-FACED CONE CLUTCH.]

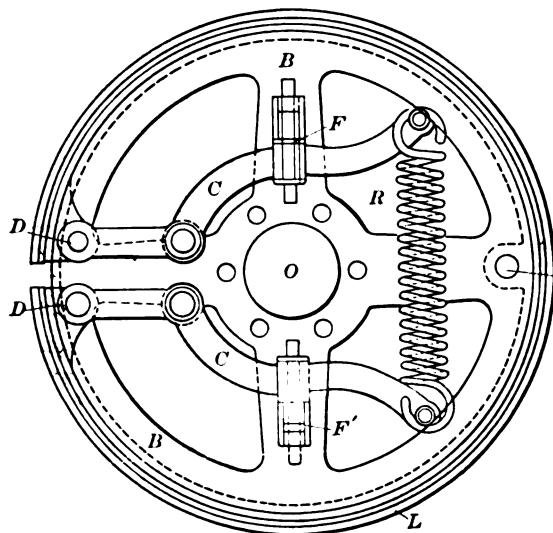
pedal. In most clutches one of the shafts telescopes into the other, fitting into a bronze bushing which serves as a bearing and steadies and accurately centers the cone in the recess. Sometimes the leather clutch facing is omitted, and the clutch is then a metal-to-metal cone clutch.

Cone Clutch with Split Ring.

An interesting variation of the cone clutch consists of an inverted cone clutch with a split ring interposed between the two friction surfaces. The cone itself does not, therefore, come into contact with the casing, but causes the split ring to expand and set up the requisite friction with the casing. A wedge in the split prevents the ring from moving around the cone, and the same wedge is arranged to move up and fill the gap as it opens when the ring is expanded. This split ring clutch is made also with inverted cone. The clutch casing is filled with oil, and the parts are automatically lubricated.

Expanding Cylindrical Ring Clutch.

In another type of clutch there is a cylindrical drum attached to the driving shaft and a split expanding ring inside, the ring being expanded against the inner periphery of the drum when the driver presses his pedal. The illustration of this type shows the expanding ring idea as used in a French car. A four-armed steel plate *B* is rigidly secured to the end of the clutch shaft, and this plate carries the entire clutch mechanism. Fulcrumed on it are two curved levers *C* whose ends *D* are on pivots projecting from the ends of the split ring *L*. The opposite ends of the levers are normally drawn together by a strong helical spring *R*, which, acting on the long ends of the levers, gives a very strong pressure on the ring. In order to disengage the clutch toggle levers *M* and *N* are pivoted on the usual sliding collar *E* and are also pivoted to the curved levers at *F*. When the collar is pushed toward the clutch by means of a suitable collar and fork arrangement in connection with a pedal, the toggle arms force the ends *D* of the levers toward each other, thus withdrawing the ring from contact with the drum and allowing the two parts to run independent of one another. The friction surface of the split ring is covered with camel's-hair belting, which is said to be remarkably durable and unaffected by oil or water.



A FRENCH EXPANDING RING CLUTCH

AUTOS PREDOMINATE ON JERSEY SHORE.

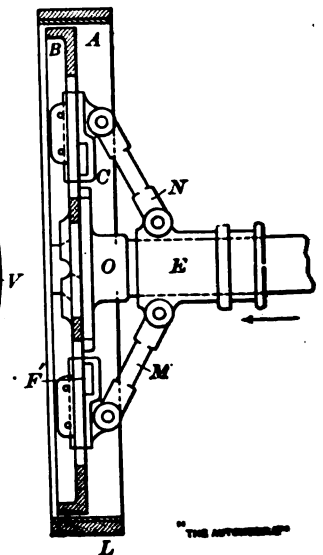
ASBURY PARK, N. J., June 25.—New Jersey's motor vehicle commissioner, J. B. R. Smith, testified to the importance of Monmouth county as an automobiling center by the appointment of three deputy commissioners for the county, one of whom, Charles R. Zacharias, is from Asbury Park. Mr. Zacharias keeps one of the largest automobile garages in the state, and is well known to every automobilist along the shore. One of the other deputies is located at Seabright, and the third is at Freehold, the county seat.

Every day brings additional cars to the New Jersey shore resorts, and the roads are full of them. One need only to spend an hour on the Ocean Drive between Long Branch and Asbury Park on a Sunday afternoon to see practically every make of automobile in the world.

Another vantage point for lovers of automobiles is at the railway stations in the late afternoons when the family bread-winner is due to arrive from the city. It used to be a collection of beautiful horses and handsome carriages that was seen at these places, but now the automobile predominates. At Red Bank, Long Branch, West End, Elberon, Deal, Allenhurst, and as far south as Belmar and Spring Lake the afternoon trip to the railway station in an automobile to meet husband, father or sweetheart is the feature of the day to the summer girl.

FOREIGN 'BUS EXPERIMENTS AT PROVIDENCE.

PROVIDENCE, June 25.—The American Locomotive Company has imported an automobile passenger 'bus from Switzerland and is conducting experiments to determine its adaptability to conditions of transportation in this city. The machine which was built by Adolph Saurer & Sons, at Arbon, has attracted a great deal of attention since its arrival a few days ago. The parts of the machine were shipped separately from the other side of the water and assembled at the company's work shops in this city. It is a large affair, about the size of an ordinary horse car, has a wheelbase of 12 feet, and will seat sixteen passengers. The



machine weighs 7,500 pounds, has a 24-horsepower engine capable of developing a speed of fifteen miles an hour. The rear wheels are fitted with two tires each, placed side by side, which provides a broad base and is said to lessen the vibration. This multiple tire arrangement is being adopted by several manufacturers of heavy vehicles with good results. The company has been working out plans and designs for railway motor cars for some time, and it is expected that the actual manufacture of the cars will be commenced in a short time.

EARLY SUMMER AUTOMOBILE CLUB NEWS

Recent Cross Walk Fatality Rouses Clevelanders.

CLEVELAND, O., June 25.—Members of the Cleveland Automobile Club are very much interested in the results of the investigation now going on regarding the cause of the accident which resulted in the death of Morris Osborne, son of a prominent coal man, which occurred near Wickliffe some two weeks ago. Young Osborne, who was 19 years of age, was riding on Euclid avenue with a friend, Walter Robinson, when the machine struck an obstruction and was overturned. Young Osborne was crushed to death under the car, while his companion was severely injured. The obstruction was in the shape of a bridge across the road, built by C. Merrill, a road supervisor of Lake County, and he claims that it was built for a crosswalk so that his family might cross the street without going in the mud. Automobilists, however, believe that this and other similar crosswalks have been built in that district to annoy automobilists, and to prevent them from making any kind of speed. The Cleveland Automobile Club took up the matter and hired an attorney to prosecute the case. No action will be taken, however, until the coroner has completed his inquest.

A feature which makes the case particularly aggravating to the members of the club is that only a short time before Secretary Goddard had sent a communication to the road supervisor complaining against the annoying crosswalks in that vicinity. Instead of leveling them off, it appears that another and higher one was constructed at this point, with the fatal results mentioned. The F. B. Stearns Company, which built the machine that Mr. Osborne was driving, will aid in the prosecution of the case if it is considered possible to make a case against the road supervisor. Mr. Stearns was a cousin and close friend of the unfortunate young driver.

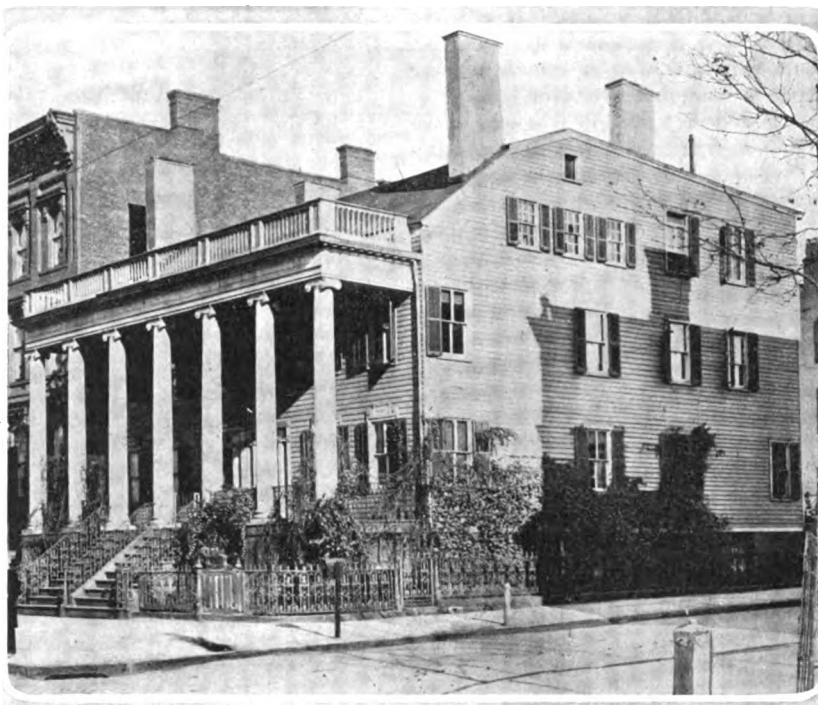
The longest tour ever arranged by the Cleveland Automobile Club will be a five-day trip to Mt. Clemens, Mich., and return, starting Sunday, July 1. The schedule will be an easy one and the cars will travel singly, meeting only at agreed-upon points in the evening, this eliminating the annoyance of dust and the temptation for racing. On Sunday the members will make Toledo, 120 miles, and Monday they will run through Detroit to Mt. Clemens, remaining there all day Tuesday. The start for home will be made on Wednesday morning, July 4, stopping over night either at Detroit or Toledo, and returning to Cleveland Thursday. An invitation has been issued to all local owners, whether members of the club or not, to make the trip.

New Jersey A. C. Clubhouse to Be Put in Readiness.

NEWARK, N. J., June 26.—All necessary papers having been signed between the owners of the property and the officials of the New Jersey Automobile and Motor Club for the five-year lease of the Osborne mansion, which was described in last week's issue of THE AUTOMOBILE, the work of altering it into a first-class clubhouse will begin at once. The illustration published on this page will give an idea of the house as it now looks, and its fine location near the heart of the city will make it exceptionally attractive to members, both present and prospective.

Automobilists from New Jersey are being held up while traveling through Pennsylvania, by the wholesale. One Jerseyite was fined \$36 for driving without a Pennsylvania license, and he had been in the State but an hour. Another,

a Newarker, boldly traveled along and put up a fine front, telling every officer he met that he was on his way to the office of the commissioner of highways to get a license, and would then ask the nearest way to reach there. He went through the experience about a dozen times before he got out of the State.



NEW HOME OF THE NEW JERSEY AUTOMOBILE AND MOTOR CLUB AT NEWARK.

Auburn Club Will Greet Glidden Tourists.

AUBURN, N. Y., June 25.—Extensive preparations are being made by the Automobile Club of Auburn to entertain the Glidden tourists when they arrive in

this city on July 12. At the last meeting of the club, President William F. Wait presided and ten new members were elected. A committee on entertainment, consisting of S. C. Tallman, Dr. George W. Whitney, and Wilbur B. Barnes, was appointed, with power to arrange matters. It was voted to make the Osborne House the official headquarters, where from 200 to 300 guests can be accommodated. George H. Leonard was deputed to make arrangements for the care and storage of cars of the contestants, without expense to them, and make arrangements for the supplies and repairs that may be required. The club's committee on road signs reported that 50 signs had been ordered, giving directions to tourists at the turning and corner points in Cayuga County on the route from Syracuse to Rochester, both east and west, and from Auburn to Ithaca.

Detroit Club's Activity in Road Building.

DETROIT, MICH., June 25.—To the members of the Detroit Automobile Club due credit should be awarded for their individual efforts in road building. To reach the new inland lake clubhouse of the club, it has been necessary, hitherto, to drive

to Pontiac, thence to Orchard Lake, and turn in around Pine Lake to the point where the building stands. As the drive was close to eleven miles from Detroit, it occurred to President E. S. George of the club that a short cut might be made by a cut from Bloomfield Hills, and he started to work on the plan. The farmers in the vicinity fell in with the scheme, and the property has been opened up with a roadway that will save six miles of the distance. Over \$800 has been subscribed for construction work, and the road has been scraped and leveled the greater part of the way. Signs are being placed along the route, and work will continue all summer, under the charge of an executive committee of three, which employs a capable superintendent of construction.

Ohio's Bungled Law Causes All Sorts of Trouble.

COLUMBUS, O., June 26.—Resolutions condemning the persons guilty of the practice of throwing tacks, nails, broken glass, and other dangerous articles on the streets to stop scorching, have been adopted by the Columbus Automobile Club, which, while it has no sympathy for reckless auto driving, is strongly opposed to the use of unlawful methods to stop them, especially when the means employed works such injury to innocent parties.

The repeal of the old automobile law by which owners were required to take out city numbers has left the local authorities without means of identification in cases where the speed limit is violated, the new law not being enforced because of its bungled provisions. To catch the violators policemen are detailed to watch the thoroughfares they frequent, and during the past week there have been a number of arrests, one of the victims being Postmaster Harry Krumm, who, in fact, was the first one to get into the meshes of the law since the present crusade against auto scorching began. The inability of the police to control the situation led a number of people to take the matter in their own hands, and some of them went to such an extreme as to scatter tacks, nails, and broken glass over the streets. In some places ropes were stretched across the streets to bring the drivers to a stop. But the infliction of fines during the past week has had a salutary effect, and there is less speeding. The local automobile club is co-operating with the police in suppressing the speeding nuisance, but the members regard as outrageous the lawless means resorted to by many to stop the practice.

Buffalo Will Have an Orphans' Day, July 10.

BUFFALO, N. Y., June 25.—At the recent meeting of the board of directors of the Automobile Club of Buffalo, Tuesday, July 10, was the date set for the second annual automobile ride of the orphans of the city. Secretary Lewis hopes to have several hundred cars in line, and is making heroic efforts to secure the loan of cars for the occasion. Last year's Orphans' Day was very successful, and this year it is hoped to more than double the number on the tour.

The Automobile Club of Buffalo, of which Percy Pierce is a member, is preparing to give him a reception on his return home. His fellow members were greatly relieved to learn that the man with whose carriage his car collided in Germany, on the return from the Herkomer contest, was not fatally injured, as at first reported.

The club has experienced a phenomenal growth in membership so far this year, and especially during the last two months. At a meeting of the membership committee last week 24 applicants were elected to membership, bringing the total to between six and seven hundred.

A number of road signs have been donated to the club by President H. A. Meldrum. The first road to be covered this summer will be the one between Buffalo and Niagara Falls, and, while it is not necessary to place many direction signs over that route, several danger signs will be put at railroad and other crossings. The club will erect danger signs at the approaches to all steep grades in Erie and Niagara counties.

Chicago A. C. Ready to Build Its Clubhouse.

CHICAGO, June 25.—Delay in awarding contracts for the construction of the new clubhouse of the Chicago Automobile Club came to an end last week, when the deal was put through securing an additional plot of land, 26x93 feet, which was necessary to carry out the plans as submitted by the architect of the new building. Assured of the extra land, the auxiliary association of the club in charge of the matter can now go ahead with the work of construction. The plans call for a five-story structure front and three in the rear. The garage will be located in the three-story section and be separated from the main building by a fire wall.

In spite of the fact that the club vacated its Michigan avenue house on May 1, and is now temporarily occupying two rooms in the Fisher building, the membership list continues to swell. Almost 600 members are on the roll, and each week an average of three is added. By the time the new home of the club is completed it is expected there will be fully 1,000 members.

St. Louis Automobile Club Plans a Fall Carnival.

ST. LOUIS, Mo., June 25.—A big parade and a two days' carnival is to be held in this city next fall, if the present plans of the St. Louis Automobile Club are carried out. October 1 is the date set for the street parade, and every automobile owner in the city and vicinity will be invited to participate. The parade will be held in the evening, as will the display of the following day, when a battle of flowers will be arranged as a climax for the occasion. The recent success of the automobile race meet run by the club at the old fair-grounds has awakened much interest in automobiling circles.

There is every probability of a State automobile association being formed on July 8, at the banquet to be given by the Kansas City Automobile Club in that city. President A. B. Lambert, of the St. Louis Automobile Club, Attorney-General Hadley, and Alexander Euston will be among the speakers.

CLUB DOINGS IN GENERAL.

WILMINGTON, N. C.—Automobile races on the Wrightsville Beach at low tide will be run on July 4, by the Wilmington Automobile Club, just organized. Two events are on the program, one for runabouts and one for touring cars.

WORCESTER, MASS.—President J. P. Coghlin, of the Worcester Automobile Club, has come out strongly in favor of improving Dead Horse Hill, so that climbing contests may be held annually on it in the future that will be national in character. It is proposed to widen the course, and the club will present the matter to the various manufacturers' associations for their consideration.

MINNEAPOLIS, MINN.—Twelve new members were elected at the last meeting of the board of trustees. The club sent a representative to the State road convention, which was in session at Duluth the middle of the present month. The object of the convention was to promote the building of a first-class highway from St. Paul to Duluth. The club has issued skeleton maps showing selected runs in and about the country surrounding Minneapolis, ranging from 25 to 150 miles.

ROCHESTER, N. Y.—Chilly weather on June 23 and heavy, threatening clouds were responsible for the postponement of the opening of Genesee Valley Park with a series of gymkhana sports under the auspices of the Rochester Automobile Club, until July 7. The archery contest was held during the morning, as scheduled, but at noon the weather became so threatening that the park committee deemed it advisable to postpone the celebration until the date mentioned.

MR. EDGE ON SIX CYLINDERS.

Editor THE AUTOMOBILE:

[337.]—In your issue of May 31, I notice an article by E. R. Thomas who gives his reasons for discontinuing to make six-cylinder cars. As a believer in and a successful manufacturer of the six-cylinder Napier, may I be allowed in your paper to take up point by point Mr. Thomas' reasons for discontinuing the six-cylinder principle? I do so because I would like to see the English-speaking people get the full advantage from the six-cylinder principle, of which my own firm—The Napier—are reaping a very great advantage at the moment.

As you may remember, we introduced the six-cylinder principle some three years ago and to-day we have a factory employing over 1,000 men turning out nothing but six-cylinder cars of two models—the 40-horsepower and the 60-horsepower. We are getting out, on an average, ten a week now and hope to do for next year between fifteen and twenty per week. These are all big and expensive cars, and if we could make smaller cars we could very easily treble our output. France, Germany and Italy are all now buying regularly from us under firm business contracts.

We, ourselves, had many difficulties when commencing with the six-cylinder principle, to make it a thoroughly commercial success. To-day the six-cylinder engine is running with greater satisfaction in the hands of the ordinary user than four cylinders of equal horsepower. This is speaking generally. Now to deal with Mr. Thomas' points:

(1) He says the torque and vibration is less with six cylinders. I agree with him, but when he says this advantage is not perceptible when on the road, I cannot agree with him. Ask any independent person who has tried two perfect cars—one a four-cylinder and the other a six-cylinder. There cannot be any comparison. With a six-cylinder you do not know you are on an explosive engine, on the four-cylinder, when the engine speed gets a bit slow, you feel every impulse.

(2) Mr. Thomas says it is obvious that six-cylinders weigh more than four-cylinders. That is perfectly correct, but he omits to state that if you require an engine to give a given power that it requires six smaller cylinders than a four-cylinder engine does and in practice the actual weights are as follows:

40-horsepower six-cylinder Napier giving 48-horsepower on the brake, weighs complete with flywheel, carbureter, etc., 608 pounds.

40-horsepower four-cylinder Napier giving 49-horsepower on the brake, weighs complete with flywheel, carbureter, etc., 617 pounds.

(3) He still assumes that the six-cylinder engine is heavier than the four, and therefore puts more weight on the front axle. As his first assumption is incorrect as I have proved, it falls to the ground, but outside this he knows quite as well as I do that the question of the amount of weight on the front wheels can be easily governed by the position of the front axle.

It is also incorrect to say that a car steers best with a small amount of weight on the front wheel. As a matter of fact racing cars which steer better than any other, if correctly designed, have very frequently nearly two-thirds of their total weight on the front axle and then with this weight so placed, I speak from experience, I find the steering is better than that with very light weight on the front wheel and a very large amount of weight on the back axle.

(4) Mr. Thomas states that the six-cylinder engine requires 10 or more inches more longitudinal space from the dash. This I find in practice is incorrect. Our 5-inch bore four-cylinder engine is equivalent to our 4-inch bore six-cylinder engine in horsepower, and the total diameter of cylinders is 20 inches in the case of the four-cylinder and 24 inches in the case of the six. Allowing, however, for a few other differences, I find that in practice the six-cylinder engine of the same horsepower, is $5\frac{1}{2}$ inches longer than the four.

(5) Mr. Thomas says that six cylinders of equal piston area will develop less power than four. This is not my experience of the Napier. With six 4-inch cylinders, 4-inch stroke, we have developed 52 horsepower. The total cubic capacity of the cylinders being 301 inches, car. Mr. Thomas point to any four-cylinder engine giving equal power with the same cubic capacity? I think not.

If multiplication of cylinders is bad for efficiency, why is it that to-day the two fastest cars in the world have six and eight cylinders respectively, when these cars have to be built under a limit of weight? If Mr. Thomas' theories are correct a large four-cylinder engine would give a faster car.

As to the question of six-cylinder giving trouble, I agree that theoretically this should be so, but users know from practice that apparently the constant and smooth turning motion of the six-cylinder does actually cause less trouble than the more irregular four-cylinder engine; just in the same way that in the olden days when we used two-cylinder engines people used to say four cylinders were more complicated and gave more trouble, but in practice four cylinders gave less trouble than the two, and six even less than four.

I agree that the timing of the six-cylinder engine is more difficult than the four but this is a question for the factory; it does

not interest the user, neither does the question of the wiring, the lubrication, the cooling or getting the proper mixture and distribution of gas from the carbureter. These are all points that the manufacturer has to look to, and if he is unable to cope with these difficulties then he does no business; but if he does cope with them he certainly gives the user a more perfect car if it has six cylinders than if it has four.

In regard to the question of six cylinders not being economical in consumption of gasoline, I enclose you herewith copy of the certificate obtained from the Automobile Club of Great Britain and Ireland in regard to Petrol Consumption, from which you will see nearly nineteen miles to the gallon was run on a Napier 4-inch six-cylinder car, and I enclose you copy of Farraday House test, by which you will see the horsepower developed by this engine was very considerable over 40-horsepower. In a recent gasoline consumption test held in America I did not see that engines of similar horsepower ran with equally small consumption even though they had four cylinder engines.

As to the suggestion that the six-cylinder car is a "fad," I cannot help thinking that Mr. Thomas has become disheartened with his manufacturing difficulties too soon. I felt just the same at one time, but every time I went for a ride on a six-cylinder Napier, I felt that once a user had been for a ride on a six-cylinder he would not listen to anyone who told him of all the difficulties one had in the factory to perfect the six-cylinder, and now having perfected the six-cylinder, I seriously commend every enterprising manufacturer who wants to build a powerful car to really realize and understand about the merits of six-cylinder engines in England.

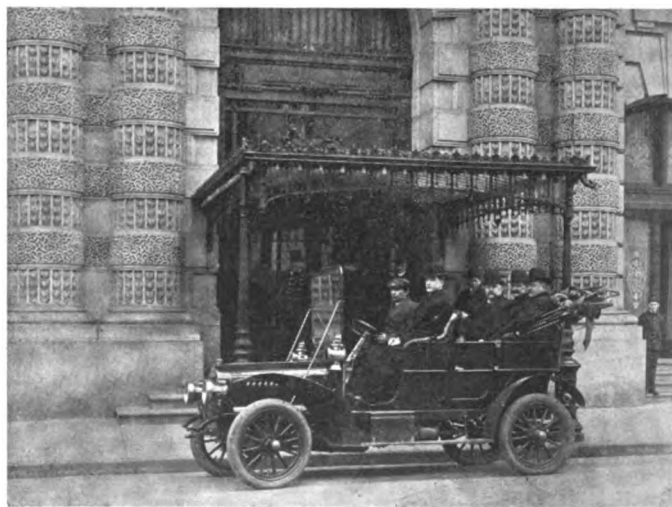
I have thrown open the Napier factory to any English manufacturer who wants to see what we are doing, as I am more than anxious to see the English-speaking race lead the world in automobile construction. Naturally, I prefer a British firm to lead, but after a British firm I would like to see an American in preference to a foreigner, and I hope if there are any American manufacturers coming to London this year they will pay a visit to the Napier factory, so that they can see how we have succeeded in making six-cylinder Napiers a commercial success, reasonable in price and of great pleasure and satisfaction to hundreds of users who own the cars at the present time.

S. F. EDGE.

London, Eng., June 13.

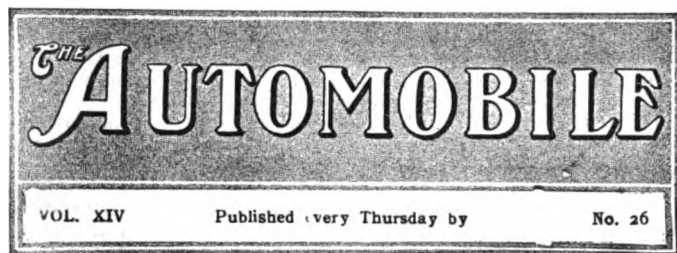
THE REAL JUGGERNAUT OF THE STREETS.

"Yes, automobiles are a bit dangerous at street crossings," said the traffic policeman, "but the biggest is not to be compared for danger to a drunken driver, driving a felt shod horse, harnessed to a rubber tired hansom, with the lights out. Even the quietest automobiles make some noise, but the combination I have just named gives the pedestrian no warning whatever. There are more narrow escapes from horse-propelled vehicles on Broadway than from automobiles. Of course, when an auto knocks a man down the papers make a sensation of it, but five men are hurt by horse-drawn vehicles to one by the horseless kind."—*New York Sun*.



MARYLAND MUNICIPAL DIGNITARIES IN A RAMBLER.

Mayor Timanus of Baltimore on right in the tonneau and ex-Mayor Whyte o Cumberland on the left.



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turn on a road that is much traveled; and especially when the turn is made from an inferior road or street into a main thoroughfare. All vehicles on main streets and roads have the right of way. Turning to the right artistically, with a car of long wheelbase, requires a considerable amount of skill so as not to get off the right side of the road. Other frequently noted violations are, slowing down or stopping suddenly without signaling to those who are following, and also stopping for repairs or adjustments in the middle of the road. A car should always be driven close to the curb or road line before a voluntary stop is made. And when stopping for any length of time on a country road, the car should be pushed onto the roadside if surface conditions permit.

Many automobilists were and are horsemen, and almost unconsciously they do the right thing even when there is not much time to think about it. Some, however, have had no practice in riding or driving, perhaps not even with a bicycle, and have not given the subject any serious attention. To such, who have the opportunity, we suggest the plan of driving out with some owner of a good horse and noting the "how" and the "when."

All horse drivers are not courteous and considerate of the rights of other road users. But whether or not, those who drive horses for pleasure usually know the rules of the road even if they do not observe them, and they certainly can appreciate that knowledge in others.



Hotel Men Will Aid Persecuted Automobilists.

One of the direct results of over-zealous officialism in the alleged enforcement of speed laws on Long Island, has been the formation of an organization of prominent hotel men, whose business is being greatly interfered with by the lynx-eyed Javerts of the highways. Country hotels are the necessary adjuncts to pleasurable touring, but automobilists are very apt to shun the districts whose officials make a specialty of holding up every passing car for an alleged infraction of the law, causing an endless chain of inconvenience to the owner, even though it may be proven he was not exceeding the speed limit. The object of the new hotel men's organization is to encourage the use of the southern Long Island roads by autoists, and to protect and defend those who are unjustly accused of speeding. It will thus be seen that the inherent right of defense from persecution is still a strong American characteristic, and "mine host" may become a powerful factor in shaping automobile legislation of the future. At any rate, since the formation of the hotel men's association there has been a sudden cessation of activities on the part of local officials in southern Long Island townships.



Burden of the New Jersey Law.

The new statute known as the Freylinghuysen law which goes into effect in New Jersey July 1, promises to become a two-edged sword. There are thousands of automobilists who, rather than submit to the exacting conditions imposed, may give New Jersey the go-by this summer. Already there are murmurings from proprietors of hotels of loss in patronage, and so far there have been under 4,000 automobiles registered in the state this year, against a total of 17,000 registered under the old law. The best way to get rid of a bad law is to have its effects react on the commonwealth that imposes it, and New Jersey will come in for little sympathy should the law prove to be a boomerang, as it now promises to be. There is an old adage which says you can lead a horse to water but can't make him drink, which may be applied to the automobilist who is a non-resident. A season or two of "splendid isolation" might bring the legislators of the state to their senses.

Courtesy to Others in Driving.

In automobilism, whether around one's own locality or on tour, there should be a punctilious observance of the rules of the road. Among drivers of good road horses there is an unwritten code, any departure from which, without good cause, is regarded as a distinct mark of boorishness or illbreeding. Either on these grounds or the more selfish one of policy, the automobilist cannot afford to be outdone by the horseman in the practice of courtesy in driving. It is unfortunately the fact that an automobilist often lays himself open to serious criticism, if nothing worse, by violating a rule or a custom that he is totally ignorant of—his intentions are as good as those of his critics; it is his knowledge of what to do and when to do it that is deficient.

In automobilism there are two distinct functions which the driver must perform. One is the management of the automobile as a machine, and the other is the handling of the automobile as a vehicle, using the public roads in common with all others. This dual responsibility should never be lost sight of even in any emergency. Incompetent handling of the car as a machine may result in nothing worse than an inexpensive replacement of some component, while careless driving may result in a heavy bill of damages assessed by an unsympathetic jury.

One of the commonest errors of automobile driving is to "cut in" ahead of a vehicle going in the same direction, so that the horse-driver must swerve from his course to avoid collision. This is a gross violation of road courtesy, and may easily occasion a serious accident. Another equally common infraction is cutting a corner when making a left

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" " This Issue, - - - - -	15,000
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SZISZ WINS THE GRAND PRIX.

By A. G. BATCHELDER.

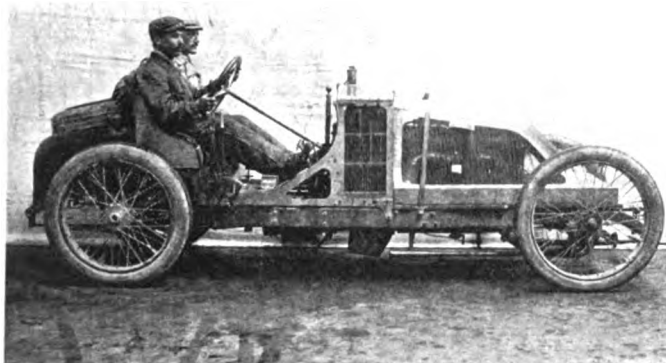
Special Cable Report to THE AUTOMOBILE.

LE MANS, FRANCE, June 27.—Francois Szisz, on a 110-horsepower Renault, won the Grand Prix to-day. Time, 12h. 14m. 7s.; Nazarro second, 12h., 46m., 26s.; Clement third, 12h., 49m., 46s.; Barillier fourth, 13h., 53m.; Lancia fifth, Heath sixth, Baras seventh. Shepherd, smashed wire wheels. Hemery out after first round. Rigoly dropped out. Teste broke leg in accident.

How the Race Was Started.

PONT-DE-GENNE, GRAND STAND, LA SARTHE, FRANCE, June 26.—The sun rises early these June days, but an enormous crowd to-day vies with it for early-rising honors, and jams the triangular circuit, invades the stands, and disappears in the adjoining fields to reach some favorable vantage ground along the course. At a quarter to six a brief order "No more cars admitted" is given. The companies of infantry brush the tarred road every 100 yards on the 103 kilometers of the triangle, and red and blue garbed soldiers with guns and bayonets flashing see that no one strides across the racing way.

The monsters are in line for the start, some roaring tremendously from time to time—the DeDietrich, No. 1, first, with



SZISZ ON HIS 110-HORSEPOWER WINNING RENAULT

Driver Gabriel carelessly leaning against the big bonnet, behind him Lancia on his Fiat makes demonstrative jests with a group of four or five admirers, his big, jolly face red with excitement. He wears a short sweater and a pair of overalls. Suddenly the first thirteen cars are simultaneously cranked, and their imposing voices are heard like a band of drums. Gabriel reaches the starting line. The starter and a judge give him his parting injunctions, he nods his head and adjusts his goggles, his machine a-quiver with excitement of suppressed energy. Little Gabriel maneuvers his clutch lever, places his foot on the pedal and is given the count. "*Etes-vous-prêt?*" "*Oui.*" "*Dix, neuf, huit, sept, six, cinq, quatre, trois, deux, un*"—bang, cracks the pistol, than a metallic sound, that decreasing like a sigh, fills the air, a little gray smoke sweeps the brown road, and in a twinkling a small swift-moving dot ascends the hill and is lost in the distance. Another, which leaves in a storm of explosions, is already pursuing the first, and another and a fourth and a fifth—Lancia, Szisz, Hemery, Barras, etc.

At eleven o'clock Szisz in his Renault appeared to be winning, in fantastic fashion, the first stage of the race. He passed the stand for the fifth time like a shadow. He overtook Gabriel and Lancia together in the second lap between Cherre and Lamnay, after passing LaFerte-Bernard, before reaching the Vibraye forest. Barras was coming fast behind, and Albert Clement was close to Szisz's heels. Szisz won the first stage of the race, his speed averaging close to 70 miles an hour. His time for the 619 kilometers (375 miles) was 5:45:30 2-5. A. C. Clement in a Clement-Bayard was second, time 6:11:40; Nazarro in a Fiat,

third, time 6:26:53; Shepard, the American amateur driver, in a Hotchkiss, fourth, time 6:30:45. Sixteen cars were officially classified as finishing the first day's stage of the race.

Two accidents occurred the first day. Fabry, driving his 140-horsepower Itala, collided with a wall near Connere, and his machine was completely disabled but neither he nor his mechanic was injured. Le Blon, driving a 135-horsepower Hotchkiss, ran into a ditch, going a 75 mile an hour gait, and upset without sustaining personal injury. The car was wrecked.

Gordon-Bennett Not to Be Revived.

The international delegates present voted not to revive the Gordon-Bennett International Cup, France, Germany, Belgium and Italy voting against and England for the revival.

MORE VANDERBILT ENTRIES.

As July 1, the date for closing the entry lists for the Vanderbilt Cup race elimination trials, approaches, the number of cars aspiring to the honor of racing for the cup increases. There are now entered nine American candidates—two Thomas Flyers, two Frayer-Millers, a Haynes, an Oldsmobile, a Matheson, a Pope-Toledo, and a B. L. M. One of the Thomas cars will be driven by C. A. Coey, of Chicago, and the other by M. Roberts, who drove the Thomas in last year's eliminations. The Haynes will be driven by Frank Sweigert, the Oldsmobile by Ernest D. Keeler, and one of the Frayer-Miller cars by Lee Frayer. Entries are expected of the Wayne, Christie, and Maxwell cars, and among the reported possibilities are a third Thomas, a White steam car, and a Royal Tourist.

GLIDDEN ENTRY LIST SWELLS.

Eighteen entries for the Glidden Tour had been received by Superintendent Tucker up to going to press. Of these twelve have already been published in THE AUTOMOBILE, and the later entries are as follows:

No. 13.—Walter C. White, c. o. White Sewing Machine Co., Rose Bldg., Cleveland, Ohio. Buffalo to Bretton Woods. Will not contest for Glidden Trophy. White car of 18 h.p. Two in party. Cleveland Automobile Club. Will run as Pilot.

No. 14.—Phillip S. Flinn, 320 Diamond Street, Pittsburg, Pa. Buffalo to Bretton Woods. Will contest for Glidden Trophy. Pierce Arrow car of 32 h.p. Three in party. Pittsburg Automobile Club.

No. 15.—William E. Wright, c. o. Knox Automobile Co., Springfield, Mass. Buffalo to Bretton Woods. Will contest for Glidden Trophy. Knox car of 35-40 h.p. Five in party. Springfield Automobile Club.

No. 16.—Robert B. Craufurd, Hotel Marie Antoinette, New York City. Buffalo to Bretton Woods. Will contest for Glidden Trophy. Stevens-Duryea car of 50 h.p. Five in party. Automobile Club of America.

No. 17.—Henry Paulman, 1321 Michigan Ave., Chicago, Ill. Chicago to Bretton Woods. Will contest for Glidden Trophy. Pierce Great Arrow car of 40-45 h.p. Five in party. Chicago Automobile Club.

No. 18.—Hart D. Newman, New Orleans, La. Buffalo to Bretton Woods. Will contest for Glidden Trophy. Packard car of 24 h.p. Four in party. New Orleans Automobile Club.

WAR DEPARTMENT BUYS AUTOS.

WASHINGTON, D. C., June 26.—Quartermaster General Humphries has ordered for immediate delivery two White steamers, a Royal tourist and a Franklin light truck for the use of the United States Army during summer manouvers. General Grant will use the Royal Tourist at Mount Gretna, Pa., and the White steamers will be used by the commanding generals at Fort Riley, Kan., and Indianapolis. The Franklin truck will be used by the quartermaster at Mount Gretna, Pa. Commanding generals have been requested to make reports to the War Department on the merits and demerits of cars used by them. It is thought the action of the department is the forerunner of an extensive use of automobiles in the army.

PERCY PIERCE SAILS FOR HOME.

Cablegrams received by the George N. Pierce Company, Buffalo, state that Percy Pierce sailed for home June 27, and will enter the Glidden tour. Advices received the latter part of last week showed that the early reports of a fatality in his collision on the return from the Herkomer tour were unfounded.

HENRY FORD HAS HIS SAY.

Considerable talk has been created by the recent action of Judge Lacombe in New York, who declared John B. Trevor in contempt of court because he bought an unlicensed foreign car after he had agreed to the validity of the Selden patent. The validity of the claims of the Selden patent are being fought in the courts by the Ford Motor Company, which makes the assertion that until this suit is decided in the courts, no case can be made against anyone else unless he invites it. That the Ford Motor Company is determined to contest every inch of the ground with the Selden patent owners, and that Ford neither will ask nor give quarter, is evidenced by the following pointed statements given out by Henry Ford:

"The Selden people, in line with their policy of intimidation, evidently wish to make it appear that the individual buyer of an unlicensed car is menaced by this decision, which decision, they would have the public believe, has a bearing on the validity of the Selden patent. A casual review of the situation will show that this conviction for contempt was only what might have been expected under the circumstances, and has no bearing whatever on the validity of the Selden claims. As I understand it, Mr. Trevor had previously bought a foreign-made car through an unlicensed agent. Suit was instituted against him by the Selden people, and, rather than go to the expense and trouble to fight it, Mr. Trevor allowed a consent decree to issue against him—thereby tacitly admitting, so far as he personally was concerned, the validity of the Selden patent. He later purchased another car and, despite his previous action, repudiated the right of the A. L. A. M. to exact tribute in the form of royalty. In view of his previous action, this was clearly in contempt of the court to whose ruling he had assented, and the judge rightly so ruled.

"It has been a favorite method of the Selden people to institute friendly suits with some apparently belligerent individual who, after putting up a lame fight, finally confesses judgment. These so-called victories are always used by the A. L. A. M. as scare-crows to intimidate buyers. To one who is familiar with the peculiar tactics of the Selden people, Mr. Trevor's position in this matter looks dubious to say the least, and astute observers are likely to accuse him of bad faith in the matter.

"If there is any basis for the claims of Selden, the owners of that patent, the A. L. A. M., have a good chance to demonstrate it in the pending suit with the Ford Motor Company. Why do they not vigorously press that suit instead of taking advantage of every technicality to secure delays and otherwise impede the progress of the litigation in the very evident attempt to put the day of final decision afar off?

"If they must attack an individual, why not go after Mr. Thos. F. Ryan, who practically controls the Electric Vehicle Company, which concern gets three-fifths of the many thousands of dollars which some makers are paying in royalties. Only a few weeks ago I am informed, Mr. Ryan purchased an unlicensed car through the Mercedes Import Company, though the Smith & Mabley Company have been selling Mercedes for years and have paid many thousands of dollars to the licensed association.

"There are something like 135 manufacturers of automobiles in this country, of them, thirty-two or three, I believe, are included in the licensed association. Among the prominent foreign car builders who scoff at the claims of the Selden people and decline to pay tribute are the Mercedes, Panhard, Renault, Brasier, Leon Bollée, Mors, and the C. G. V.

"No buyer of a car need have any fear of being enjoined from buying or using any car that suits his fancy and his pocketbook until after the association has settled this patent suit with the Ford Motor Company in the courts. Men have been, and will be, convicted of contempt of court for as many offenses as there are courts and litigants, but we cannot see where such convictions will ever serve to prove the validity of a patent, or to interfere with the selling of automobiles."

FRAYER-MILLER STICKS TO COLUMBUS.

COLUMBUS, O., June 23.—Negotiations for the removal of the Oscar Lear Automobile Company, makers of the Frayer-Miller, from this city to Zanesville, are off, and the company will remain in this city. A site was to be given the company and \$100,000 loaned it, and, in addition, a loan of \$100,000 was to be made, which money was to be used in the construction of a large plant. Just as the contract was to be signed the local banks refused to assume the liability of the subscribers to the loan, and after two or three efforts to get the matter adjusted, the company abandoned the project.

POOR INDIANA STATISTICS.

INDIANAPOLIS, IND., June 25.—Through a number of errors, for which the manufacturers themselves are believed to be responsible, the figures compiled by State Statistician Joseph W. Stubbs on the automobile industry of the state have been found to be practically worthless. Several months ago the employees of the office began gathering data on the automobile industry, together with other industries, as they existed in Indiana in 1905. The figures have just been compiled, but the automobile industry, undoubtedly one of the most important in the state, appears practically insignificant alongside of some of the others.

Where automobiles should rank near the head, the data gathered shows that the industry ranks forty-first, and it cannot be known for at least another year the true rating of the automobile factories, the number of men they employ, or the capital invested. This is a disappointment to automobile manufacturers, as they have contended all along that their industry was one of the largest.

According to the figures, which have not yet generally been made public, there were eight factories in Indiana for the manufacturing of automobiles, and three for the manufacturing of accessories. The capital invested in these eight factories is represented as \$1,140,509. The salaries paid out during the year amounted to \$482,198, which were paid to 789 men. The value of the product is given at \$1,595,302. The three manufacturers of bodies and parts are represented as having a capital stock of \$53,495, with twenty-seven employees earning \$14,242. The product is given at \$42,300.

It has been found that some of the largest factories in the state are not represented under the head of automobile manufacturing, and much of the credit for the business goes to the horse-drawn vehicle industry. For instance, Studebaker's at South Bend, are given under the latter head, with no mention of automobiles, while the Columbia Electric Manufacturing Company at McCordsville appears under "Telephones." There is such a number of like errors that it will be practically impossible to straighten out in time for the 1905 report of the state statistician, which is about ready to go to press.

Only four automobile factories are credited to Indianapolis, one to Auburn and one to Kokomo. The Indianapolis factories had a capital stock of \$810,060, employing 447 men at salaries amounting to \$277,844. The product was valued at \$797,652. There are now nine factories in Indianapolis, seven of which were in the city in 1905.

A NEWLY CONSTRUCTED CHICAGO PLANT.

The new three-story factory of the Holsman Automobile Company, of Chicago, has been completed, and the company has moved its machinery into the building. The structure is 50 x 250 feet,



three stories in height, and will enable the Holsman people to vastly increase their output. This concern has been manufacturing automobiles for four years, and has been running a night and day force in the old factory for the past year.

DETACHABLE RIMS FOR THE GRAND PRIX

PARIS, June 15.—An extremely interesting feature of the Grand Prix will be the use of detachable rims and tires by some of the competing cars. As the drivers and mechanics must do all their own work without outside assistance, manufacturers have looked for some easy method of changing tires, and the two devices described herewith have been adopted. Both these systems allow spare inflated tires to

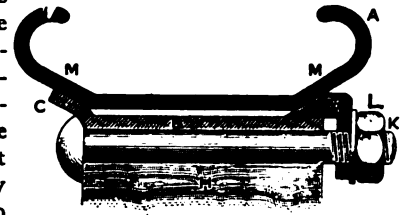
be carried on the car and replaced for a disabled tire in from one and a half to two minutes without the use of a pump or special tools.

The patent M. L. rim, which has been on the French market since the last Paris Salon, is sold by the Société des Jantes Amovibles M. L., of 112 rue Richelieu, Paris, and although patented abroad, is at present only to be found in London and Paris.

An ordinary wooden wheel may be converted, or the wheels may be specially constructed. On the outer edge of the road wheel are embedded six bolts projecting about three-quarters of an inch. The detachable rim, which is of steel, has the same flanged edges as an ordinary rim. Six projecting ears are riveted within the circumference of the rim and near its outer edge. Each of these ears is drilled to fit the bolts projecting from the face of the wheel. The tire is fixed on this rim, the air chamber inserted, and inflated exactly as an ordinary automobile wheel. The rim is then slid on the road wheel, the bolts on the wheel passing through the ears on the rim and held in position by nuts. Provision is made for the projecting valve by a notch cut in the wooden rim, and as a further security against creeping the ears are countersunk into the wooden and metal rims of the wheel. The surface of the rim coming in contact with the felloe consists of two steel rails machine finished, with a groove between them, in which are imbedded the nuts holding the valve on its seating and the bolts of the leather cover of which the air chamber rests. Being flush with the level of the rails, it is impossible for the bolts to work loose.

The Vinet rim will also be seen in the Grand Prix. M. Kepferer, of 24 rue de la Rochefoucault, Paris, is the only selling agent. As in the system just described, the Vinet consists of a double rim, one part being fixed on the wheel and the other bearing the tire being detachable. The flat steel rim *B* encircling the road wheel *H* carries on its interior edge a ridge *C*, against which is pressed one edge of the detachable rim *M M*. This latter has only to be slid on to the wheel, the diameter of the wheel being about four millimeters less than

that of the rim in order to make the operation easy. Five or six projections on the detachable rim fit into indentations on the fixed rim, preventing one rim revolving on the other. The rim placed in position, a steel ring *E*, split to facilitate mounting and having one of its faces beveled to fit against the face of *M M*, is placed over the six projecting bolts on the wooden rim and held in position by nuts *L*. To dismount a tire it is only necessary to unscrew the nuts *L*, take off the split ring *E* and withdraw the rim and tire *M M*. A special short valve has to be employed, not projecting beyond the false rim *M M*. To inflate the tire it is necessary to dismount it. An improved model is now being made in which the fixed rim of wood and metal is pierced to allow of the passage of a prolongation of the valve, screwing into the valve embedded within the false rim. By this means it would not be necessary to dismount the rim to inflate the tires.



CROSS SECTION OF VINET RIM.

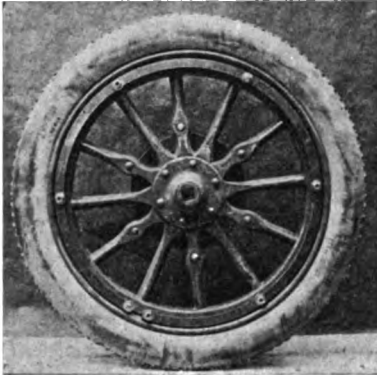
All the cars employing these rims in the Grand Prix race will carry two spare tires completely inflated. When a change is necessary the tire will be changed and dropped off at the first repair station and another taken on board. Valuable time will certainly be saved, and, seeing that seconds will probably decide the winning or losing of the race, one might at first suppose that all cars would be fitted with these wheels. The weight limit of 1,000 kilos, however, prevents several competitors from adopting them, and the private objections of drivers may be a determining factor in other cases.

Clément Bayard and Vulpés cars are certain to be fitted with either Vinet or M. L. rims, while other firms, having given them extensive trials but not having yet definitely decided, are Darracq, Renault, and Brasier. The Itala, to be driven by Baron de Caters, will stick to fixed rims, declares M. Henri Fournier.

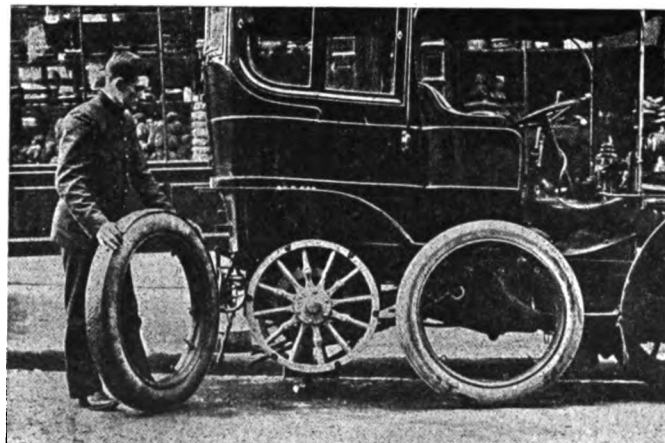
In all previous big road races the most elaborate preparations have been made to keep good tires under the cars, and the scores of tire experts stationed at intervals around the course have often had a very important, though not fully appreciated, share in placing the cars at the finish. Stacks of tires, patent pumps, steel tanks of compressed air, the most ingenious tire tools and the

pick of the tire men have been considered essential to a great road race, and the scene when a car dashed up to a tire depot to have tires changed was spirited; the tire men would rush out with sharp knives and with dexterous strokes cut the tires from the wheels, giving way instantly to another gang carrying new tires ready to apply. A third set of men would be ready with the hose connections from the air tanks, and in a short time the car would be again on its way. In the meantime the driver and his mechanic could take things as

easily as their dispositions would permit. While a picturesque feature has been removed, the new arrangement will doubtless do much to develop a more convenient method of fastening tires.



VINET DETACHABLE RIM.



THE M. L. RIM WITH TIRE REMOVED.

CHICAGO'S 100-MILE RELIABILITY RUN.

CHICAGO, June 25.—At a meeting of the Chicago Automobile Dealers' Association held last week it was definitely decided to hold a 100-mile reliability contest over the Elgin-Aurora course on some day between July 15 and August 1. The committee which will manage the test is J. F. Gunther, chairman; W. L. Githens and G. Bennett. Messrs. Guntehr, W. L. Githens and Thomas Hayes have inspected the century course and found it satisfactory. They also found it to be exactly 105 miles in length starting from the Auditorium Annex. Many signboards will be placed along the road in order that the contestants may not stray from the path. They will attend to this detail on their next trip.

City authorities contemplated removing the gasoline tanks beneath the alleys in the rear of garages along Michigan avenue, but an injunction has been filed, under the leadership of Orlando Weber, restraining the authorities from taking the step until the matter has been settled in court. Those who were represented in the injunction proceedings were Fred E. Dayton, Webb Jay and C. A. Coey & Co. The grounds for the injunction were based on the grounds that the alleys are not city property but private. The case was handled by Secretary S. S. Gorham of the A. A. A. and Attorney W. Jennings.

A large number of Chicagoans have already entered for the Glidden tour, among them being J. H. McDuffee, C. A. Coey, Charles Y. Young and N. H. VanSicklen. Mr. Coey will drive a Thomas Flyer, Mr. VanSicklen will have his Apperson, Mr. Knight is to steer his *Silent Knight* and Mr. McDuffee will be seen in a Stoddart-Dayton. The tour is exciting great interest in local club circles.

TRADE MATTERS IN PHILADELPHIA.

PHILADELPHIA, June 25.—The summer solstice is bringing with it the usual stagnation. "The Row" is quieter now than at any time during the past six months. Next year's models are already being looked for, and the Rambler, Cadillac and Pierce people are announcing the early appearance of their 1907 machines. It is a season of preparation, and repairs have been in order all along the row during the past fortnight. The big new garage of the Rambler, at 207-209 North Broad street, is expected to be under roof by August 15, and ready for business a month later.

Harry De Groat, who handled the Union bicycle in Philadelphia in the late '90s, has succeeded to the sales managership of the Philadelphia branch of Thomas B. Jeffery & Co. Harvey Coulbert, formerly with the Diamond Rubber Company, has also joined the Philadelphia Rambler forces.

The Rainier company has given up its establishment at 236 North Broad street, and the opening was immediately snapped up by the Diamond Motor Car Company, formerly of 2117-19 North Broad street, which has long been looking for a "Row" location. The latter concern handles the Cleveland and Jackson automobiles.

HOOSIER CAPITAL TO HAVE ORPHANS' DAY.

INDIANAPOLIS, June 18.—An orphans' day outing, similar to events of the kind given annually in New York, Boston and other Eastern cities, is being planned for this city by Cecil Gibson, of the Gibson-Short Cycle and Auto Company. It will be given some time in July, the date not having been set. There are half a dozen orphans' asylums in Indianapolis, containing about 500 orphans, and the plans will include giving every one of the unfortunate little folks an afternoon's ride in an up-to-date touring car. The trip will probably include a tour of the city, followed by a run to Broad Ripple and a few hours at White City, an amusement park, where the little folks will be the guests of the management. Everything possible will be done to make them have an enjoyable afternoon, and no expense will be spared to make the affair a pronounced success.

WESTON-MOTT PREPARING TO MOVE.

At Flint, Mich., on Wednesday, June 20, articles of incorporation of the Weston-Mott Company were signed. The company was organized with a capitalization of \$500,000—\$400,000 issued at once, and \$100,000 to be retained in the treasury of the company; the present members of the Weston-Mott Company, Utica, N. Y., taking \$300,000 of the capital stock, and residents of Flint, \$100,000, divided among some twenty-five different people. The officers of the company will be: C. S. Mott, president; Hubert Dalton, vice-president; and William G. Doolittle, secretary and treasurer, all officers of the Weston-Mott Company, of Utica. C. S. Mott was elected general manager, and Hubert Dalton factory manager of the new company.

The new factory at Flint is nearly completed, and has floor space of three times the capacity of the Utica plant. Mr. Dalton will be located in Flint July 15, at which time the factory will be finished, and a large amount of machinery and material will be on the grounds. As soon as Mr. Dalton has installed, in productive condition, the large amount of new machinery that has been purchased, he will have sent to him from Utica the machinery from that plant in carload lots only, as fast as he can get it up and in operation. By this procedure it is figured that the output will at no time be less than the present, and should be considerably greater even during the moving period.

The Utica plant at present employs 300 men, and when the Flint plant receives all the machinery from Utica, it will employ 450 or 500, and will double the present output.

TRADE NEWS FROM THE TIRE CITY.

AKRON, O., June 25.—Application for the incorporation of the Williams Motor Carriage Company was made in South Dakota this week, the incorporators being H. A. Williams, Henry Robinson, J. F. Townsend, George W. Phillips, Ed. L. Grantham and Harvey Musser. The company will manufacture the new automobile designed by H. A. Williams, who has constructed a machine on entirely new lines, with the body suspended on the running gear on three points connected by socket and ball, the object being to have the body always horizontal. Speed levers and brakes are also eliminated in this car, the brakes are to be controlled by compressed air and solid tires will be used. It is expected to lease or erect a plant in this city for the manufacture of the machine. Some of the stockholders have large capital.

The Firestone Tire and Rubber Company of this city presents evidence that the Ford runabout is really and truly going to come out. This week it shipped its second solid carload of pneumatic mechanically fastened tires to the Ford Motor Company on an order received some time ago. The Firestone company is also doing considerable business in San Francisco, notwithstanding the earthquake, as it shipped a full carload of carriage tires to that city this week. Nearly all of the officials, office force and heads of departments of the Firestone Tire and Rubber Company enjoyed an outing at Silver Lake Thursday afternoon and evening, ending the festivities with a banquet. H. S. Firestone, the president and general manager of the company, was present and was the leader in all of the sports and fun of the occasion.

AUTO OUTING FOR BLIND BOYS.

BOSTON, June 25.—The annual automobile outing of the boys from the Perkins Institution for the Blind of South Boston, given by the Boston Automobile Dealers' Association, took place last Friday, and thirty-five youngsters who are sightless were given an all-day trip into the country. The association inaugurated this affair a year ago and the boys enjoyed the treat so much that it was determined to repeat the trip. An invitation was therefore extended to the orchestra of the institution and was immediately accepted. The boys were accompanied on the trip by ten leaders, so that a dozen cars were necessary.

A NEW MECHANICAL LUBRICATOR.

An interesting example of the tendency of makers of automobile accessories to perfect details with a view to securing efficient operation and accurate adjustment is shown in a mechanical lubricator made by the Lavigne Manufacturing Company, of Detroit, Mich. The oiler is of the gang-pump type and is driven by a worm and gear; all moving parts are positively operated. The main feature of novelty in the oiler is the method of adjusting the rate of feed. Each pump



LAVIGNE MECHANICAL OILER.

can be separately adjusted to any desired feed rate without in any way affecting the rate of feed of the other pumps. This is done by means of adjusting shells which screw down over the plungers and regulate the length of stroke. The shell and the rod passing up through it are graduated after the manner of a micrometer caliper, there being horizontal graduations marked on the rod and vertical graduations on the shell, the latter being compared with a vertical line on the rod. The diameter of the pump plunger is quarter of an inch and the full stroke five-sixteenths of an inch. The capacity per full stroke of one pump is .0153 of a cubic inch of oil; the stroke is divided into five parts by the horizontal graduations on the rod, and each of these five divisions is sub-divided into six by the vertical graduations on the shell, the full stroke being thus divided into thirty equal parts, each small division representing five ten-thousandths of a cubic inch of oil. By means of this arrangement the quantity of oil pumped can be adjusted exactly, and there is no difficulty in bringing back the adjustment to any given point after a change has been made. The rate of feed can be observed by means of bleeder valves attached to each feed. By pressing down a cap the oil is caused to pass through a sight drip; when the cap is released the oil returns to its regular channel.

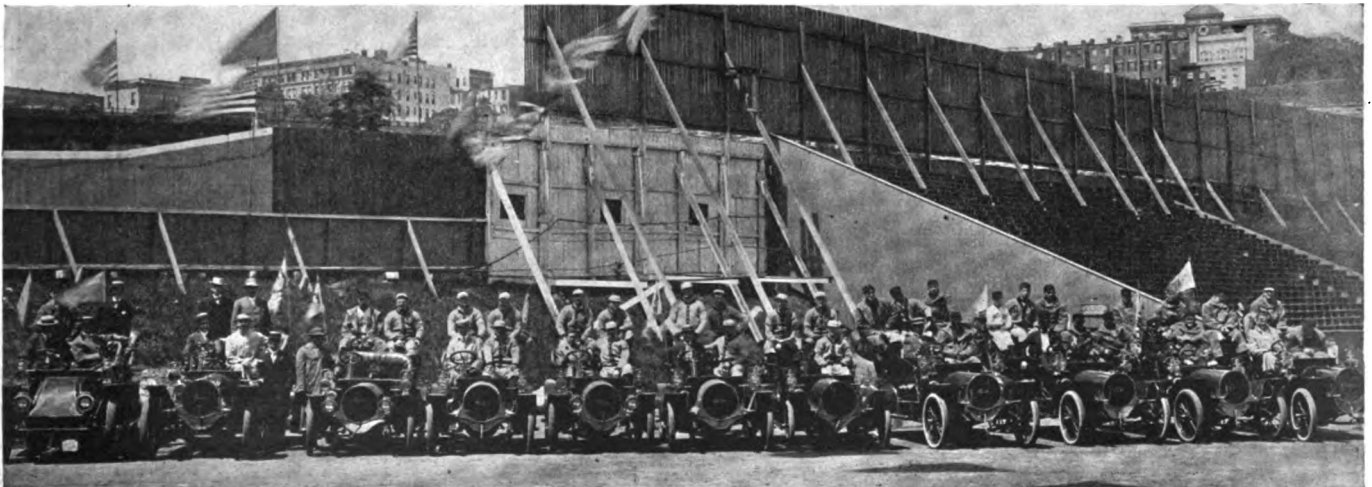
The lubricator is made in a number of different sizes and with any number of feeds from one to ten. The filling cap is fitted with a strainer, and the tank has a glass gauge.

A BASEBALL PARADE VIA AUTOMOBILE.

While stories are heard on every hand concerning the speed possibilities of the automobile, and, a little less frequently, of actual accomplishments, accounts of feats of the slow-speed variety are not often met with. It is a fact, however, that an automobile that cannot maintain a slow pace may sometimes find itself in quite as humiliating a position as the car that is enveloped in the dust of a faster rival. A public demonstration of the slow-moving qualities of fast automobiles was given at the recent parade of baseball clubs in New York city on the occasion of the raising of the championship pennant won by the New York team, the Giants, in 1905. Through the courtesy of C. F. Wyckoff and E. S. Partidge, respectively president and vice-president of the Decauville Automobile Company, of New York, sixteen cars—English Daimlers, C. G. V. S. and Franklins—were used to carry the victorious Giants through the city in the parade. The parade consisted largely of baseball men and boys on foot, every club within reach of New York that could muster up anything resembling uniforms being permitted to participate. The small boys' clubs were out in full force, and to their short legs was largely due the fact that the maximum speed of the parade was four miles an hour, and frequent stops were made for rest. So the cars had their work cut out for them, especially as the day was a warm one. But all got through without a hitch, the drivers squeezing their throttles down hard and watching carefully for the dreaded overheating of their cylinders. All arrived at the base-ball grounds in good condition, including the air-cooled cars, and then made the circuit of the field before 30,000 base-ball enthusiasts. The behavior of the cars under these conditions speaks well for modern cooling systems, whether using water or air.

RURAL DELIVERY TESTS VIA AUTOMOBILE.

WASHINGTON, D. C., June 23.—Information is given out by Fourth Assistant Postmaster-General DeGraw, who has charge of the rural free delivery service, that the Waltham Manufacturing Company, makers of the Orient, will shortly begin a series of tests to demonstrate whether or not a specially-built Orient can be successfully used in the rural free delivery service. The Postoffice Department has picked out a number of particularly hard routes in Maryland and Virginia for the trials, and they will be watched with interest by the postal authorities. The plan is to take the rural mail carriers over the selected routes in the car, which will be operated by one of the company's men. The carriers will make careful observations, which they will embody in a daily report to be submitted to Postmaster-General Cortelyou. In this way the department hopes to secure reliable data that will enable the postal authorities to lay before Congress the wisdom of appropriating a sufficient sum of money for automobiles for use in the service.



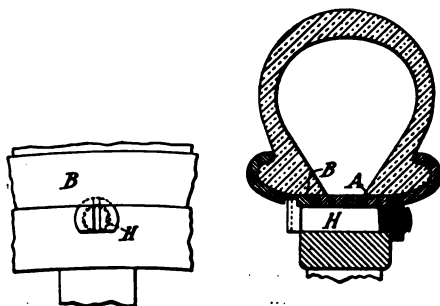
LINE OF FRANKLIN, DAIMLER AND C. G. V. CARS AT FINISH OF BASEBALL PARADE AT POLO GROUNDS, NEW YORK.

Patents

Rim for Detachable Tire.

No. 823,093.—H. B. Williams, of New York City.

This is a rim of the standard clincher section, but split into two portions, *A* and *B*, of which the latter is readily removable.



WILLIAMS DETACHABLE RIM.

It is held in place by the bolts *H*, whose heads have the special form shown in the drawings. When the tire is deflated the section *B* can be pushed back enough to release the bolt head, which is locked against turning when the rim is in the position shown. By giving the bolt a half turn the section may be slipped off.

Combined Spark Timer and Distributer.

No. 822,782.—J. M. Smith, of Philadelphia, Pa.

This is a device on conventional lines having the spark timer in the form of a metal barrel with inserted insulating segments and an external stationary brush or contact member. The secondary distributor is enclosed wholly in a hard rubber case,

and has a spring contact finger rubbing against fixed contacting members in the inner periphery of the circular casing. The brush of the spark timer is mounted on the casing of the secondary distributor and is rotated with it to advance or retard the spark.

Searchlight Control for Automobiles.

No. 823,163.—J. S. Detrick, of Baltimore, Md.

This is an operating and controlling mechanism for the dashboard searchlight, and is operated by the foot resting on a special pedal. The pedal is pivoted to rock like a sewing machine treadle, and is also pivoted to turn to the right or the left. The former motion turns the searchlight up or down, and the latter acts through a sprocket chain connection to swing the searchlight from side to side. A pair of springs hold the searchlight normally horizontal and pointing straight forward.

Change-Speed Gear.

No. 823,369.—F. W. Schroeder, of London, England.

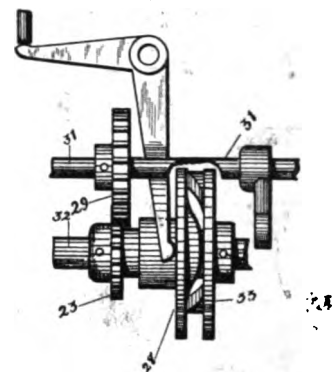
This is a change-speed gear comprising a number of beveled pinions on a sleeve slidable on the propeller shaft. The pinions are spaced so that one or another is in engagement with its corresponding bevel gear, the gears being concentric and attached to a single disk, which is retracted to allow the pinions to be shifted.

Valve Gear.

No. 823,347.—A. C. Menges, of Grand Rapids, Mich.

In the detail sketches shown 17 is the exhaust valve pushrod and 32 is the cam-shaft, on which the double-lobed face cam 33 is secured. A similar cam 28 acts against

33, and is slidable lengthwise on the hub of the pinion 23, which is loose on the shaft and is held in position by the gear 29 and rockshaft 31. This rockshaft may be turned at the will of the operator, thereby changing the angular position of 28 on 32, and correspondingly changing the timing of the ex-



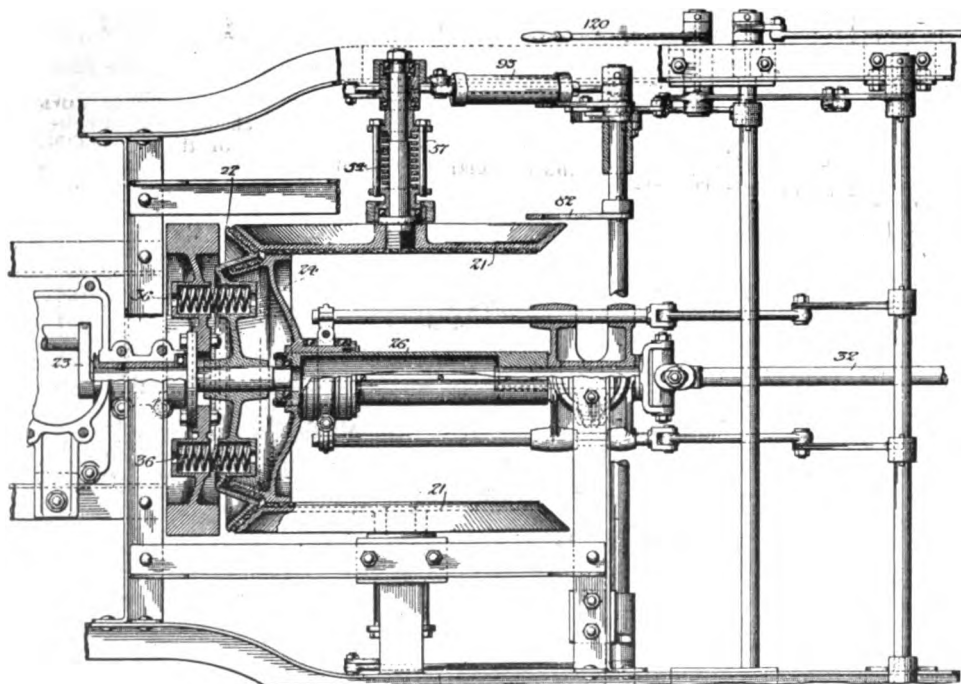
MENGES VALVE TIMING GEAR.

haust valve. A sufficient rotation of 23 will cause the engine to reverse, and a smaller rotation will retard it. The inlet valves are automatic.

Friction Transmission System.

No. 823,178.—I. Larsen & R. Hardie, of Chicago, Ill.

The object of this system is to permit direct driving on the high speed with friction devices disconnected, and at the same time to employ the minimum number of frictional elements. This is accomplished by transmitting the power for the slower speeds through the beveled friction wheels 22, 21 and the friction wheel 24, which slides on the hollow shaft 26, from which the power is communicated through a universal joint to the propeller shaft 32. The friction wheel 22 is integral with a conical clutch member, and both are carried on pins projecting from the flywheel and are backed by the springs 36. For the direct drive the clutch member on 24 engages that in 22, and the springs 36 are slightly compressed, thereby releasing 22 from 21. At the same time the disks 21 may be withdrawn from contact with 24, by means of special mechanism operated by a foot pedal attached to 82. The function of this mechanism is primarily to force 21 into contact with 24, and it consists for each disk in a pair of spiral cams, one of which is backed by a stationary ball-thrust bearing, while the other presses against a thrust bearing which acts against the spring 54. The partial rotation of the second cam against the first shifts it slightly along the shaft and compresses 54. As 54 is already compressed by the bolts 57, only a slight movement is required. A spring contained in the cylinder 93 tends to return the cams and disks to their non-working position. A pawl and ratchet hold the disks in engagement, and these are released by suitable connection with the brake mechanism.



LARSEN AND HARDIE'S FRICTION TRANSMISSION SYSTEM AND CLUTCH.

NEWS AND TRADE MISCELLANY.

The Northern Motor Car Company, of Detroit, states that a Northern car will be entered in the Glidden tour, but that the particular model has not been decided upon.

The Faulkner Mills Company, of New Bedford, Mass., has moved to 143 Summer street, Providence, R. I., and will continue its business under the name of the Providence Spark Coil Company, Ltd.

The Hollywood Automobile Company, of East Orange, N. J., is temporarily located at 118 Main street, pending the erection of their new concrete garage near by. This concern handles the Marion car.

A neat grain leather license case, for New Jersey licenses, has been brought out by the Hartford Suspension Company, of New York. A celluloid sheet permits the license to be seen without taking it out of the case.

The Northern Manufacturing Company, of Detroit, Mich., will on July 1 change its name to the Northern Motor Car Company, in order that it may be more closely associated with the automobile manufacturing business.

The Duquesne Construction Company, of Jamestown, N. Y., manufacturers of the Duquesne cars, have assigned. It is reported that the assignment is due mainly to the company's inability to secure sufficient capital to carry on the business.

Balkhan Schoyer, chief counsel for the Mexican Tramway Company, is spending two weeks at the plant of the H. H. Franklin Mfg. Co., Syracuse, N. Y., familiarizing himself with the construction of cars prior to an extended trip of Europe with a Type D.

Cable dispatches received by the White Sewing Machine Company, of Cleveland, O., report that a White steam car won the annual hill-climbing contest of the Midland Automobile Club, of Birmingham, England, defeating thirty-four competitors and making the best time by six seconds.

W. I. Fickling has purchased the entire interest of the Automobile Cover & Top Manufacturing Company, 154 East Fifty-seventh street, New York. The plant is being enlarged to accommodate painting and repair jobs on automobiles, together with all kinds of limousine, tonneau and automobile body work.

A regular meeting of the Buffalo Automobile Trade Association was held recently in the rooms of the Automobile Club of Buffalo. Much routine business was transacted and it was the sense of the meeting that the association should go to the Vanderbilt cup race in October in a body, in a special Pullman buffet car.

A new car will be put on the market next season by the Watson Machine Company, of Paterson, N. J., under the name of the Watson Conover car. The machine will have a motor of 35-40 horsepower, and will have a novel speed changing gear that is said to be very easy to operate. Hartford suspensions will be part of the regular equipment.

The New York Transportation Company has recently given its order for fifty Columbia electric landaulets similar to the Mark 67 type, to be added to its equipment of 600 other electric vehicles now used in New York City. The company is in the market also for five gasoline touring cars seating six or seven passengers besides the driver.

In last week's issue of *THE AUTOMOBILE*, in the report of the Washington automobile races held in that city June 16, the winning of two important racing events by Columbias was inadvertently omitted. Two of the most important races of the day—one for cars in the \$4,500 class and the other for cars in the \$3,000 class—were won by Columbias.

The Southern Automobile Company, of Nashville, Tenn., of which W. J. Cummins is president, has been sold to Duncan Kenner and Charles C. Codington for \$50,000. Mr. Kenner has been elected president, Mr. Codington vice-president and general manager, and Charles Gilbert auditor. W. J. Cummins retains an interest in the company and was elected one of the directors.

Already the 1907 four-cylinder Cadillac touring car has been placed before the public, one of the new machines being on exhibition and in demonstration service in Chicago. The car is a 35-horsepower machine and has a planetary transmission. C. H. Foster, manager of the Chicago agency for the Cadillac, states that deliveries of the 1907 cars will be made in from thirty to sixty days.

Owing to the demand for tuition in automobile lore, the New York Y. M. C. A. automobile classes and the garage on West Sixty-fourth street will be kept open during the greater part of the present summer, probably until nearly the middle of August. The school is in a very flourishing condition, and similar work will be taken up by other branches of the Association that have not yet entered the automobile school field.

Among recent purchasers of Locomobile gasoline cars are M. L. Ryder, Albany, N. Y.; J. W. Dunn, president International Pump Co. (two cars), New York; John F. Havemeyer, president Concrete Steel Co., New York; Rev. D. C. Martin, Pittsburg, Pa.; Arthur S. Hamilton, Rochester, N. Y.; Nathan Meis, Cincinnati, O.; F. J. McCarthy, Denver Col.; F. L. Mercer, Chicago; Charles A. Niemeyer, St. Louis; Arthur P. Hawes, Boston.

O. S. Smith and wife left the Franklin factory at Syracuse on Saturday, June 16, in a new Type H six-cylinder, bound for their home in Denver. They expect to complete the trip July 1 and intend passing from Buffalo to Detroit through southern Michigan and into Chicago. After a few days' rest the trip is to be continued through Davenport and Des Moines, Iowa, Omaha, Nebraska, and along the line of the Union Pacific railroad to Denver.

It is reported that the Eastern District of the National Metal Trades' Association, which is composed of employers in the metal shop trades, is about to send organizers to the automobile factories in the Eastern states, with the object of enrolling them in the association. Nearly all the automobile firms in the West are already members of the national body. The National Metal Trades' Association is committed to the open-shop policy and its members employ about 130,000 machinists.

President Diaz, of Mexico, has purchased his first American car. Hitherto he has been a user of foreign-made cars, but lately gave an order for a Haynes to the agents of that company in the City of Mexico, the Central Automobile Company. The Haynes company is naturally well pleased with the order, and it came to them as a surprise. American tradesmen will be glad to note

the fact that our products have received the stamp of official approval in our neighboring republic. Mexico has taken kindly to the automobile, its inhabitants being of a sport-loving disposition. Up to the present time there are no laws regulating speed there, and but few accidents reported.

It is reported that the Lozier Motor Company will move its automobile assembly department from Stamford, Conn., to Plattsburgh, N. Y., where the factory is located. Heretofore the parts have been made at the Plattsburgh works and shipped to Stamford to be set up. The company will continue the manufacture of marine engines at Plattsburgh, but will abandon the building of boat hulls, and will use the premises for the assembling department. It requires about four weeks to assemble the various parts of each car, and, as the company will have from twenty to thirty cars in the assembly department constantly, they will be able to turn out from five to eight each week when the plant is in full running order.

In a recent interview John L. Poole, of the Aerocar Company of Detroit, the well-known pioneer American automobile salesman to the foreign trade, is quoted as follows: "The Automobile Club of France sent two of the best French expert engineers to America this year, to especially study air-cooled construction. They examined all cars at the New York and Chicago shows, also visited all the leading factories, and their report, when turned in to the club, was extremely favorable to American cars in general, especially on account of their simplicity of construction, over that of European makers. Among the cars especially favorably mentioned was the Aerocar, which, in their opinion, outside of the motor, came nearer to European general construction than any other car made in this country. There is a great demand at present for the air-cooled car in Norway, Sweden, Denmark, Russia and Germany. Russia is a great field for the sale of automobiles and will be still greater when the present political disturbances have settled down to a solid basis. The air-cooled car to-day is not an experiment. It has been demonstrated under all manner of conditions and proved the fact that it does air cool under all conditions which may exist."

BLUE BOOKS TO CUSTOMERS.

The Matheson Company of New York presents to each purchaser of a Matheson automobile a copy of the "1906 Official Blue Book" with the following words printed in gold on the cover: "Compliments of the Matheson Company, New York." The book also has printed on its cover the name of the party to whom it is presented, and is enclosed in a very handsome box. The Matheson Company of New York states that the custom will be continued, but does not consider it a part of the equipment of Matheson cars. It is merely of a complimentary nature.

TRADE PUBLICATIONS.

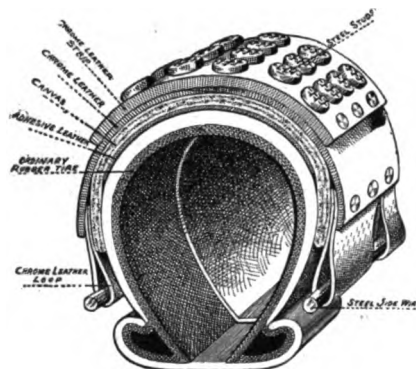
MICHELIN PRODUCTS SELLING Co., NEW YORK.—Circular regarding the merits of the Michelin pneumatic tire.

FORD MOTOR Co., DETROIT, MICH.—Instruction book for operating the Ford Model K six-cylinder car. An exceedingly practical little treatise.

MOTOR CAR EQUIPMENT Co., NEW YORK.—Very complete illustrated catalogue of automobile accessories and sundries, containing 128 pages of high-grade standard goods.

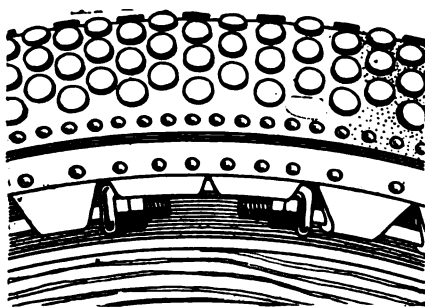
LATE SPECIALTIES OF THE TRADE.

LEATHER TIRE PROTECTOR.—A detachable leather tire protector and non-skidding band has been placed on the market by the Leather Tire Goods Company, of Newton Upper Falls, Mass., under the name of the Woodworth detachable tread. The accompanying illustrations show the tread so clearly that but little explanation is necessary. The band is held in position by steel wire rings



WOODWORTH DETACHABLE TREAD.

that pass through loops on each side of the tread. Two rings are used, one on each side, and each has a coupling where the ends join. The tread is applied without the rings, with the tire deflated. The rings are then passed through the loops and the coupling nuts screwed up and the tire inflated. The manufacturers state that the tread will not cause the tire to overheat because the steel rivets with which the tread is studded pass through and come into contact with the rubber and act as conductors for the heat; the rivets are said to have no in-



WOODWORTH TREAD RETAINING RING.

jurious effect on the surface of the tire, though severe tests have been imposed. Chrome tanned leather is used for the outer part of the tread, and a special friction leather for the inner layer. Between these are three strips of heavy canvas. The loops are also of chrome tanned leather, and, the makers state, are unaffected by water and will not stretch when wet.

NEW PORCELAIN PLUG.—Among the recent spark plugs that have been brought out with a view to improving that vital part of the equipment of the gasoline motor is the W. E. B. Sure-spark plug or Arc spark plug, illustrated herewith, manufactured by the Arc-Spark Manufacturing Company, of 125 West Thirty-second street, New York. This plug has a porcelain insulation of peculiar shape, as shown in the illustration. The surface is irregular, so that the distance that must be covered before a short-circuit is established is considerable. The rounded porcelain head projecting from the

shell of the plug is exposed to the action of the gases in the cylinder, and the manufacturers state that any deposits of carbon made on this head will be blown off, so that the plug will remain clean under un-



SURE-SPARK PORCELAIN PLUG.

favorable conditions. The makers also call attention to the easy cleaning feature of this plug; all parts can be readily reached for this purpose. The porcelains are hand molded, and so fired, the makers state, as to leave them tough and not readily broken.

NEW DOW TIMER.—The timer illustrated here has recently been brought out by the Dow Portable Electric Company, of Braintree, Mass., and embodies several features of interest. One of the strong points of the timer is that the contacts are adjustable by means of small milled-head screws. As the illustration shows, the revolving arm on the shaft of the timer carries a small roller of hardened steel at its extremity. This roller makes successive contacts with as many flat steel springs as there are cylinders in the engine. The springs themselves do not form the contacts, but are pressed against the platinum tips of the adjusting screws through which the current

passes to the binding posts on the outside of the timer case. Should the contact take place a little too early or a little too late in any cylinder or cylinders, the adjusting screws will remedy the defect and make the timing correct. Each screw is retained automatically in position by a spring catch which engages with the notches milled in the screw head. The shaft runs on double ball bearings adjustable for wear, and the instrument is dustproof.

PORTABLE ELECTRIC LIGHT.—A convenient portable light is manufactured by the American Endoscopic Company, of Providence, R. I., for automobilists and auto-boatmen. The battery cells for the light are inclosed in a neat waterproof casing. Current is carried from the battery to the lamp by a flexible cable; the lamp is inclosed in a nickel-plated cylindrical metal casing with a bull's-eye lens. The outfit may be used, the manufacturers state, either for flash lightning or for continuous work.

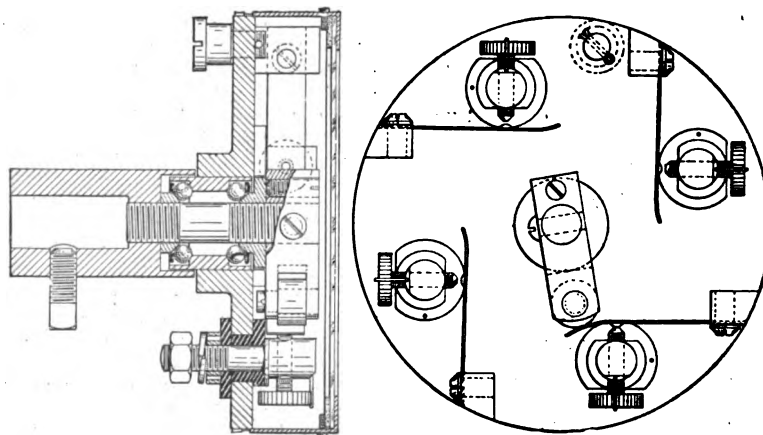
PERSONAL TRADE MENTION.

E. F. Thomas, son of E. R. Thomas, the automobile manufacturer of Buffalo, N. Y., sailed recently for Europe, accompanied by his bride.

H. A. Gillis, who has been superintendent of the American Locomotive Company's Richmond works for nine years, is to be general manager of the Autocar Company, of Ardmore, Pa., and will assume his new duties on July 1.

C. H. Ferrin, of Concord, N. H., a prominent New England automobile dealer and the Northern Motor Car Company's representative for Vermont and New Hampshire, is dead. Mr. Ferrin was an enthusiast and did much to advance the cause of automobiling.

Richard Pratt Marvin, secretary of the B. F. Goodrich Company, died on June 23, primarily from paralysis. He served as mayor of Akron, being elected in 1874 and 1878, and in 1880 he became secretary of the Goodrich company through his close friendship with Dr. B. F. Goodrich, the founder of the great rubber business in this city. Mr. Marvin was an attorney, having studied law in Jamestown, N. Y., where he was born, and while he was mayor he advised Dr. Goodrich in many matters concerning his experiments and patents. When the efforts of the founder of the Goodrich plant began to be rewarded, Mr. Marvin was offered an official position in the Goodrich company.



DOW TIMER WITH ADJUSTABLE CONTACT SCREWS.

SPECIAL NOTICES

Advertisements inserted under this heading at 20 cents per line; about 7 words make a line. Remittance should accompany copy. Replies forwarded if postage is furnished.

A MONEY MAKER—A 9-passenger break. Will make from \$50 to \$100 per week. Will sell cheap or trade on light car. B. B. & Co., Tiffin, Ohio. July5

AMERICAN—21 years of age, with shop and road experience, wishes position on a gasoline car. Has lately returned from the West where he has the best of references. Address G. F. Jackson, 409 Chestnut St., Roselle Park, N. J. June28

AUTOMOBILE OWNERS, do you want your tires repaired or recovered, by people who know how? Give us a trial, and be convinced. Inner tubes vulcanized, at short notice. Jungkind & Vogler, 158 Chambers St., New York City. Telephone, 3386 Cortlandt. July19

AT ONE-HALF COST—Rutenber 4-cylinder vertical engine, cylinders 5x6; Whitlock cellular cooler for above; two 7-inch Rushmore Searchlights with independent generator. All guaranteed as good as new. W. D. W., Box 153, Springfield, Vt. June28

AN OPPORTUNITY worth looking into, a complete Garage and Repair Shop in thriving Washington City of 85,000 inhabitants. Cadillac, Winton, Pierce and Packard agencies. Reason for selling, continued ill health of owner. Old established house. Address M. P. Benton, Seattle, Wash. July12

ABSOLUTELY THE BEST PROPOSITION OFFERED TO YOUNG MEN of good habits is a course at this school; our graduates have fine positions at salaries of \$100 per month and more; chauffeurs mastering our course are fully competent to take charge of the high-priced cars; energy and ambition with our tuition spells success; special course for Owners. Call or write New York School of Automobile Engineers, 146 West York Sixth Street, New York. t.f.

BARGAIN—16-h.p. Peerless touring car, newly painted, in perfect running order, with lamps, baskets, etc.; price, \$800. Address C. A. S., care The Automobile. June28

DRAFTSMAN—Automobile—familiar with design of both two and four-cycle engines, desires position with new firm. Location preferred, Ohio. (B.Z., care The Automobile). June28

ELMORE, 1905—We have at present three 1905 Elmore touring cars, 16-h.p., which we will dispose of at a very low figure to accommodate purchasers of 1906 machines. Elmore Automobile Company, 1851 Broadway, N. Y. t.f.

FOR SALE—Crest air-cooled 3 1/4 h.p. engine, cheap. Box 647, Corsicana, Texas. June28

FOR SALE—15-tube radiator, \$10; 24-tube, \$15. A. M. Symonds, 901 No. Fairfield Ave., Chicago, Ill. t.f.

FOR SALE—Flywheel and disconnecting clutch for 1903 or 1904 White touring car. Portland Garage, Portland, Me. t.f.

FOR SALE CHEAP—Automobile Boller and Wheel steering gear. Both in fine condition. Lock Box 41, Dedham Mass. June28

FOR SALE—1905 Elmore, as good as new; has been run about 500 miles; at a bargain. Address 501, care The Automobile. July7

FOR SALE—1904 Franklin, runabout, \$500. 1905 Franklin with tonneau, \$1,000. Both in fine condition. C. D. Hakes, Albany, N. Y. t.f.

FOR SALE—Orient Buckboard, nearly new, splendid condition, \$200. Also 16-inch boiler and 10-h.p. engine, cheap. F. Booth, Stanley, N. Y. t.f.

FOR SALE—Cheap, a carriage plant, well suited to make automobiles; situated in New York State. Address H. D. H., care The Automobile. July5

FOR SALE—Early 1906 Model four-cylinder Pullman demonstrating car, used at factory only. Like new. Price low. York Motor Car Co., York, Pa. July6

FOR SALE—One Stevens-Duryea second-hand Model "L" Runabout, thoroughly overhauled, in perfect condition, newly painted; carries two to four people; complete equipment; price, \$700. R. W. Magna, 248 Oak St., Holyoke, Mass. June28

FOR SALE—One Baker electric runabout with charging plant, one Waverley electric gear with depot body for seven passengers, two light gears, two sets of axles, two bodies. Big bargains. Describe your wants. Valley Auto Co., Warren, Ohio. July7

FOR SALE—Knox, 15-passenger sightseeing car, cost \$3,000, operated by the Ridge Road Transit Co., Inc., and only run three months, will be sold to the highest bidder July 7. Can be seen at W. H. Anderson's Ridge Road, Greece, N. Y. Sealed bids will be received and opened at 3 o'clock on above date, all bids must be accompanied by certified check for 5 per cent. of bid, which will be returned to unsuccessful bidders. J. F. Tallinger, Secretary, 224 Mill St., Rochester, N. Y. June28

GREATEST BARGAINS in used automobiles ever offered in this country; 100 different styles. Tell us about what you want and we will send you descriptive matter. C. A. Coey & Co., 1424 Michigan Ave., Chicago. t.f.

HELP WANTED—Chief Engineer capable of designing high class Cars by new company just starting. Experienced expert only. Address X. Y. Z., care The Automobile. July5

ONE MODEL B FORD TOURING CAR, complete, lamps, horn, extra tires and inner tubes. Used about five months. Price \$1,250. Holley Bros. Co., Detroit, Mich. July5

PACKARD FOLDING CHAIRS for 1906 car (like Thomas 1906), also pair large step boxes for 1905 Packard. E. T. Burrows, Portland, Me. June28

PATENTS—Hubert E. Peck, 629 F St., N. g W., Washington, D. C., Consulting Expert in Patent Causes. Send for leaflet "Rejected Patent Applications." t.f.

TWO LE MARQUIS studded tires, 3 1/2-2x34, brand new, \$55.00 each. D. W. Romaine, 207 Montgomery St., Jersey City, N. J. t.f.

TEN-PASSENGER WAGONETTE; sample car, 1905-6 model; steam; price and description on application. Thompson Auto Co., Olneyville Sq., Providence, R. I. t.f.

THOMAS 1905, 50-h.p., full equipment, just done over, in perfect condition; also 1904 Thomas, being overhauled and repainted, regular equipment, extra tires, etc., taken in exchange for 1906 Thomas Cars, for sale cheap. Wm. H. Fulper, Flemington, N. J. t.f.

TIRE BARGAINS—Just secured from large manufacturer, 500 new last season's make tires, first grade, 28x3 single tube and clincher tire casings. Can offer them at ridiculously low prices; investigate. Phone, 920 Franklin, W. M. Sharpe, 118 West Broadway, New York City. July12

WE WANT to manufacture automobile parts or devices. Anything made of cast-iron preferred. Submit designs and state quantity wanted. The Bryan Plow Co., Bryan, Ohio. July5

WANTED—Standard American touring car, 1906 model, with full equipment; must be bargain for cash. Demonstration demanded. State make and price. S. L. White, 110 W. Second St., Cincinnati, Ohio. July5

WANTED—Machinist, familiar with gasoline, steam and electric cars. Must be willing to come South and work; if capable, may put in charge of entire Garage. Address, with references, experience and terms, 924, care The Automobile. July5

WE SELL any tire on the market; new tires 20 per cent. off; second-hand tires 40 to 60 off; tires repaired; any make, any repair from blowouts or rimcuts to full covers; all guaranteed. Chicago Vulcanizing Co., 1463 Michigan Ave., Chicago, Ill. Phone, Calumet 490. June28

WANTED—Foreman in sheet metal shop, making automobile hoods, fenders, tanks, metal dashes, etc. Must be thoroughly familiar with most improved methods and machinery for reducing labor cost on this class of work. Please state fully experience and salary, also references. Address, Foreman, Box 23, The Automobile. t.f.

70-HORSEPOWER Panhard Racer, cost \$22,000; at a fraction of cost. Big snap. 249 West 47th St., New York. July12

110x218 FEET on the best street in Canton, Ohio; lot has store-room and dwelling. Price \$10,000, will take automobile as part pay. S. Burd, Massillon, Ohio. June28

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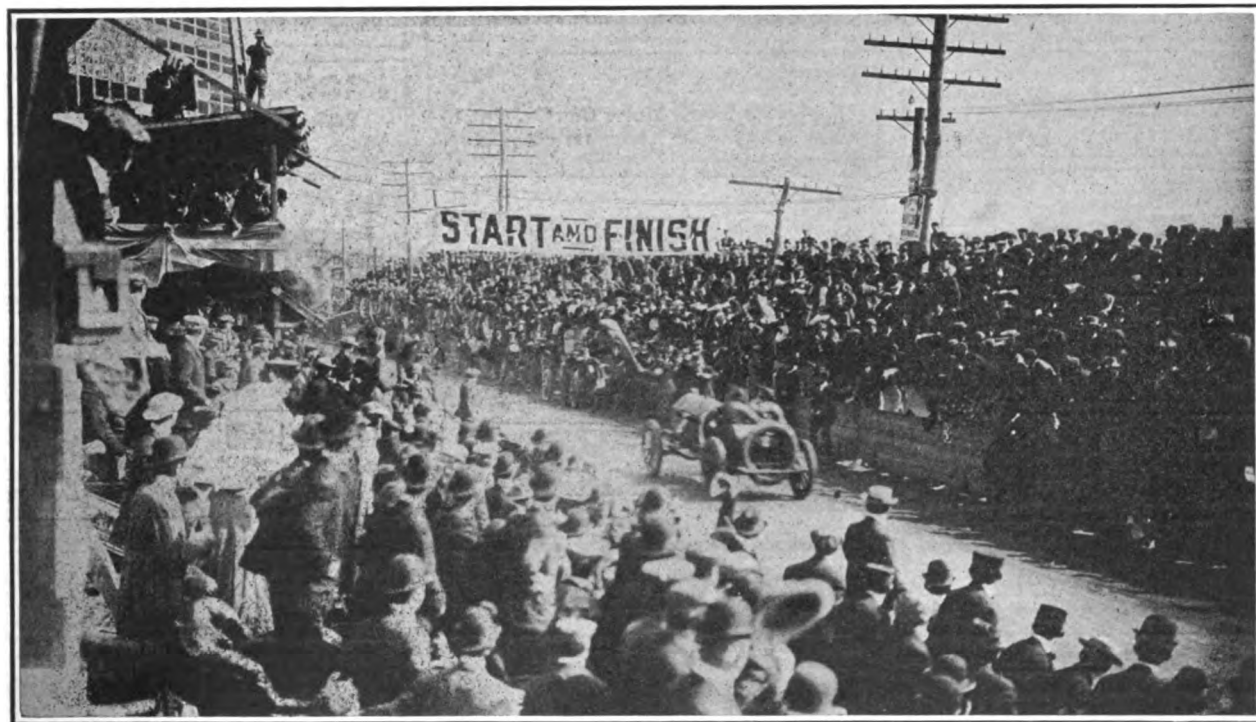
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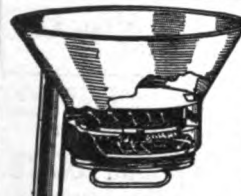
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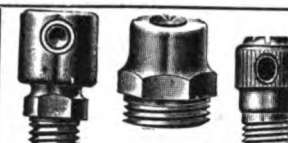
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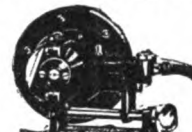
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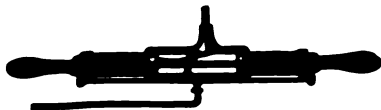
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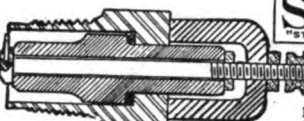
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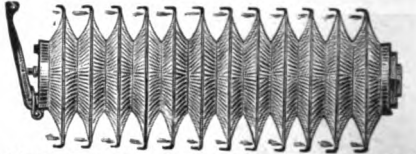
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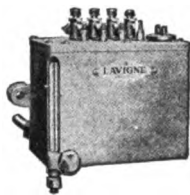
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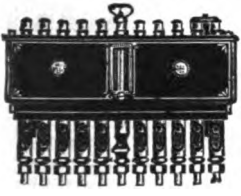
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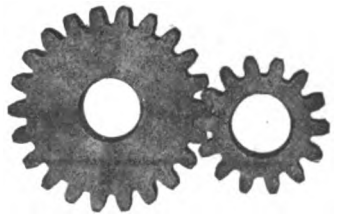
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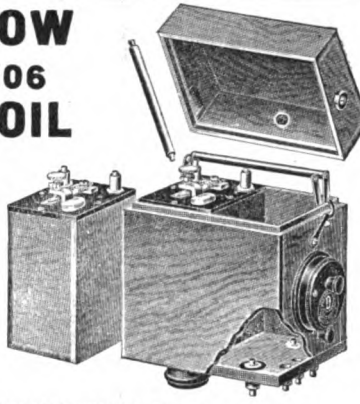
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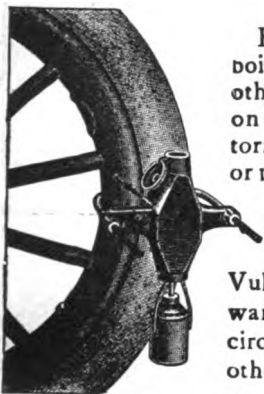
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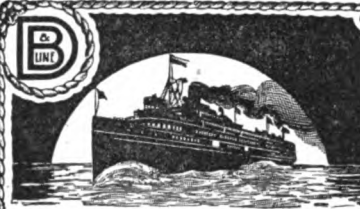
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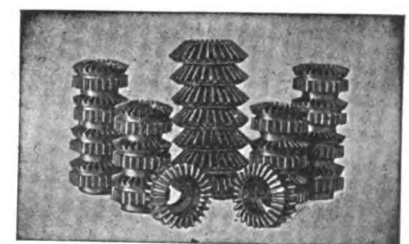
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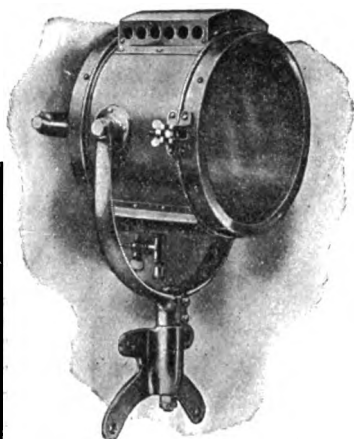
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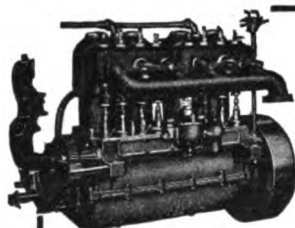
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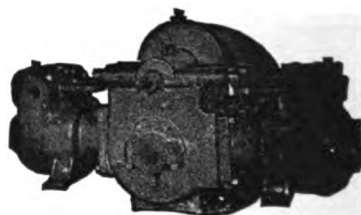


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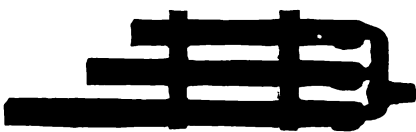
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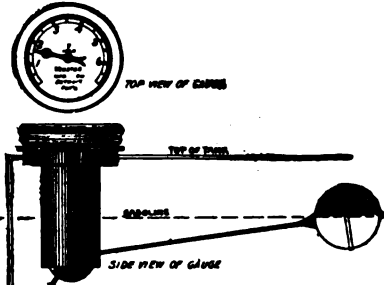
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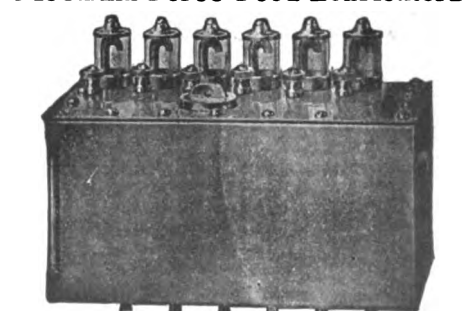
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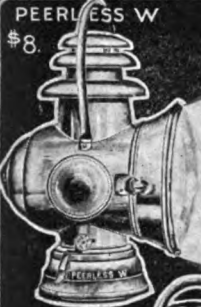
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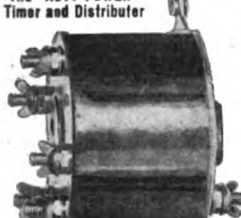
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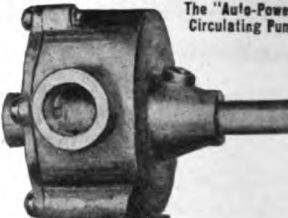
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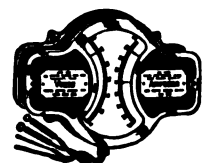
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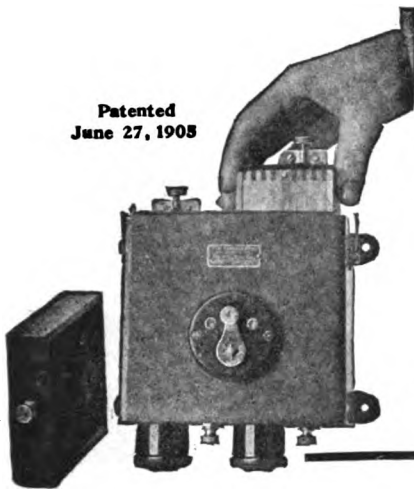
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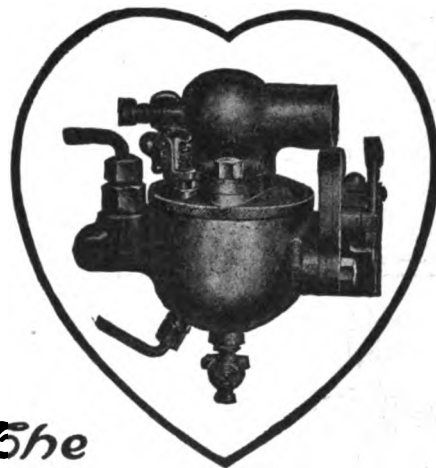
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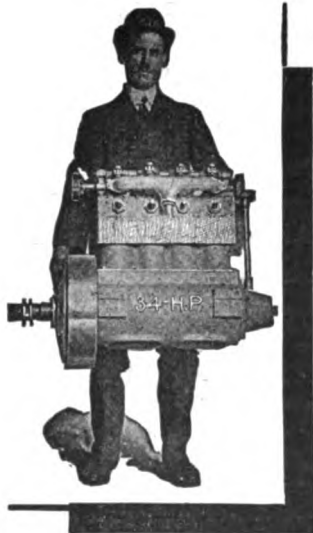
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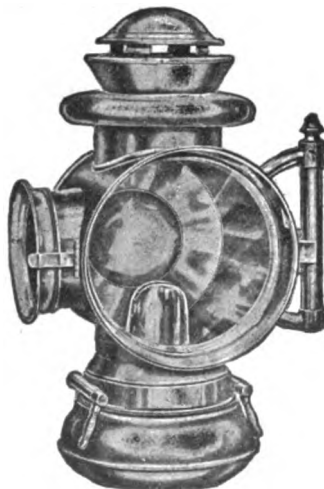
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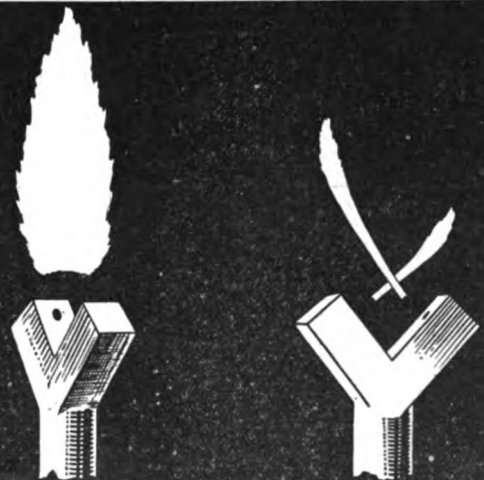
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OSBURN HOUSE,
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Table d'Hôte Dinner, \$1.00
"Quality and the joy of living."
Table d'Hôte daily—Music.
9 to 8.30

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On Automobile Row - Broadway and 88th St.
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Is only five minutes from Madison Square Garden and in the centre of the Business and Amusement District. Absolutely fireproof. European plan. Cafe and restaurant are unequalled. Long distance telephone in each room.
ELMER E. ALMY, Proprietor.

The best place for rest or recreation or
recuperation at this season is

ATLANTIC CITY

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CHALFONTE

is especially well equipped to supply
the wants of those who come to secure
them.

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RATES:**

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Occupies the geographical
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walk of sixteen theatres.
Cars pass the door, and
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Norman grill room.
Cuisine of superior ex-
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THE ERIE, THE COMMERCIAL RAILROAD
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For information address

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Imperfect Lubrication

is the cause of many cars
being worn out and discarded



**GAS ENGINE
OIL**

will save this destruction

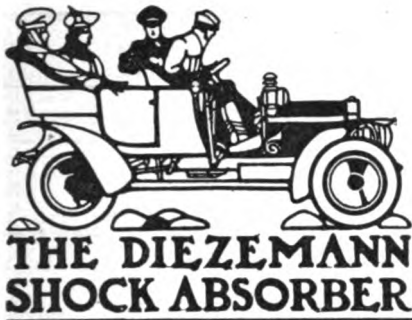
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Successors to Leonard & Ellis.

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Branch Houses: Boston, Philadelphia, Chicago,
Cincinnati, St. Louis, San Francisco, Los
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Branch Houses and Agencies in all parts of the world



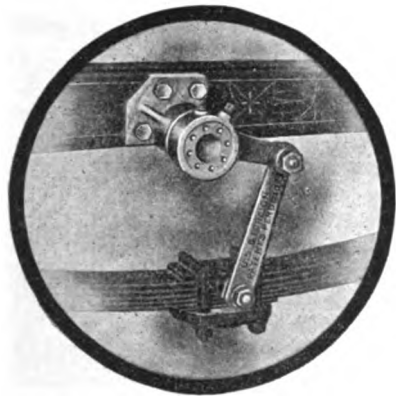
THE DIEZEMANN SHOCK ABSORBER

¶ The Diezemann Shock Absorber properly adjusted to the inside or outside of the frame of your car absolutely insures smooth running. All forms of road shocks are neutralized or absorbed, and the control of springs by this device insures longer life for the engine and tires.

¶ The Diezemann Shock Absorber is mechanically perfect, *self lubricating* and dirt proof. It may be applied in any position with equal efficiency; when once properly adjusted it requires no further regulation.

¶ Testimonials from the leading automobilists in the country endorse this device as the only practical absorber on the market.

Diezemann Shock Absorber Co.
1314 Hudson St., - Hoboken, N. J.



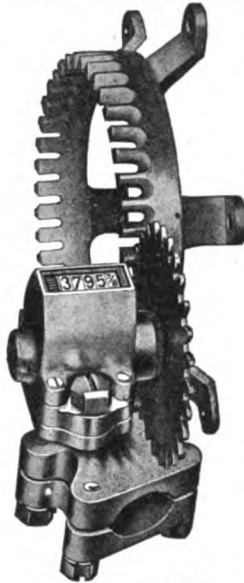
The Bullard Speed-recorder

Tells time, speed and distance your car travels, and makes a record on a detachable card of every mile traveled, when and how long stops were made, total mileage of the season, etc.

Accurate at any speed, indisputable evidence in any court. Indispensable on delivery vans and rented cars. It will record every minute the car is in use. Send for booklet to



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(Highland Station) Springfield, Mass.



VEEDER FORM B
ODOMETER

Veeder ODOMETERS

"It's nice to know
How far you go."

A Veeder Odometer is what you make it. Not only will it answer the eager question of the ladies and children as to "How far did we go to-day?" but it will give the owner or operator confidential, "inside" information as to the car itself.

If, for instance, the gasoline consumption per hundred odometer miles is greatly increasing, it plainly indicates lubrication faults, binding or failing engine efficiency—conditions readily remedied when discovered, but which in ordinary service would probably not be disclosed until something serious happened, were it not for the Odometer. The Odometer tells cold truths about batteries and tires that you might profit by knowing.

In touring, the Odometer, used in connection with a good road book, is a constant guide as to just where you are, and on arriving home you know your total mileage for the trip.

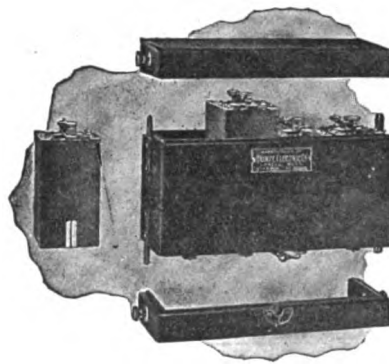
Veeder Odometers are supplied in two styles for motor cars, viz.: the Form D, for the dashboard, having both a "trip" register and a total mileage register, and the Form B Odometer, which attaches to the left steering arm and records the total mileage only. *FREE BOOKLET.*

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Makers of Cyclometers, Odometers, Tachometers, Tachodometers, Counters and Fine Castings.



SPECIFY HEINZE Motor Car Coils

to be put on your
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WHY?

BECAUSE HEINZE coils will save you \$25.00 and more every year in gasoline alone. They produce a hotter spark; have a faster vibrator, and always ignite at highest point of compression, resulting in more power and speed. Therefore greater economy.

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Send for our latest pamphlet on the care of your ignition system.

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HICKS SPEED INDICATOR COMPANY

No Fluctuation on Low Mileage Indication

**ACCURATE
RELIABLE
DURABLE**

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For MOTOR TIRES

THOUSANDS IN USE IN EUROPE
TO FIT ANY SIZE CLINCHER TIRES OR WHEELS. *Made from
the Best Chrome Leather and Metal.*

It Is Puncture Proof

Very little dust caused, as no vacuum is formed under tread. No car should go out without several of our Patent Garters in case of accidents.

An Old Worn-out Tire is made Equal to New when Our Patent Cover is put on. The resilience is not affected in any way.

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The Hatcher Auto-Parts Co.
Successors to "The Brew-Hatcher Co."
Cleveland, Ohio

Mechanical Engineers, Contractors and Manufacturers of Automobile Parts and Specialties.

We manufacture Carbureters, Tank Strainers, Brass Couplings, Engine Oilers, Grease Cups, Pipe Strainers, Universal Joints, Clutches, Double Opposed Motors, Four-Cylinder Motors and Transmissions.

OUR CARBURETERS are Automatic and furnish a perfect mixture under all speeds and conditions of weather. They are made to fit any style engine.

We prove these carbureters by allowing thirty days' trial. Send for booklet on Carbureters.

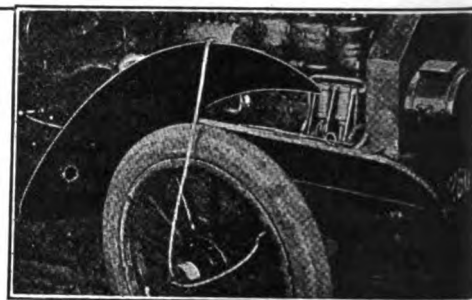
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Successors to The Brew-Hatcher Co.
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Our
TIRE PUMP

will prevent delays on the road as you can run on a fully inflated tire even if punctured.



The Pump is driven from the engine crank shaft and is engaged and disengaged by means of a clutch—the clutch shipper is located on the dash or in any other convenient place. Tires can be kept perfectly inflated while running. Not a luxury but a necessity on every car! Catalog gives details and prices. Write to-day.

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The Leavitt Ball Contact Ball Bearing Timer



Leavitt Timer

Our primary timer is the fastest made, the least affected by wear.

We have absolutely solved the question of burned contact points

Our goods are fully guaranteed.

Try Both Our Devices on Your 1906 Cars.

Submitted to manufacturers on trial.

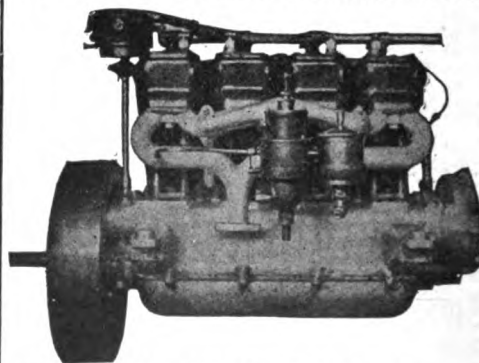
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Do You Use the Kirkham Motive Power Equipment?



IF NOT, you had better investigate them before closing for the season, as we deliver the goods in quantity and quality at the price you ought to pay.

THIS CUT shows our 18-22-H. P. 4-cylinder, water-cooled machine; weight as shown, 265 lbs. We guarantee 26 B. H. P. maximum from every motor of this type.

Are You Interested?

THE KIRKHAM MOTOR MFG. CO., BATH, N. Y.

Searls' Folding Jacks

**HAVE LIGHTEST WEIGHT
GUARANTEED STRENGTH**

Usable Broad Base or Folded
Narrow Base
Latest Construction

Foot Power. Why get down in the dirt?

Ask your dealer, or we deliver in U. S. or Canada.

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Power

Our gas generating tank makes a 40-H. P. Car of any ordinary 24-H. P. Car; puts it in the mile-a-minute class and then drives the car on half the quantity of gasoline formerly used. Besides, it absolutely prevents danger from fire or explosion. The cost? Less than a new set of tires.

We will prove it if you will write us for descriptive booklet.

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K-No. 00 SPECIAL NON-FLUID OIL FOR SLIDING GEAR TRANSMISSIONS

Over thirty auto manufacturers now use and recommend it after thorough tests, because:

First—It prevents noise and wear.

Second—It lessens shocks when changing speeds.

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You can't do as well with grease or oil, alone or mixed. You can get Non-Fluid Oils *everywhere*, but be sure that all packages bear our name and registered trade-mark. *Samples and valuable booklets free.*

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EASTERN Battery Connector

Positively Won't Shake Loose

Among the many evidences of merit and popularity

we have an order of 100,000 from C. S. KNOWLES, Boston, Mass.

ADOPTED BY U. S. ARMY
EASTERN HIGH-GRADE IGNITION
CELLS have greater efficiency
than any other cell.

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Trinity Chimes are Better than So-Called Horns



Price for Oxidized or Plain Brass Chimes, \$25

An amateur can attach our Chimes to any machine in a very short time, by four screws. Operated by a foot button. Valve and foot button furnished with every instrument.

GUARANTEE

We guarantee every Chimes to be mechanically perfect, both in workmanship and material. We will replace any and every part of the Chimes free of charge which does not do all we claim for it, viz.: give perfect harmony of tone, and, above all, lasting qualities.

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The Speedometer of the Season of 1900 "THE SPRINGFIELD"

The Hit of the New York and Chicago Shows

This cut shows the instrument and all its fittings. It attaches to the dashboard by a jointed bracket, is driven by the gear shown from either front wheel, by means of a double jacketed flexible shaft, the pinion bracket of which is universal and will fit to the steering knuckle arm of any American-built car.

This instrument will tell HOW FAST you are going, HOW FAR on each trip and HOW MANY MILES your car goes the whole season.

Its Dial is Self Luminous and can be read after dark. Its accuracy at every mile is guaranteed. It is designed and constructed for long service. Balanced Motions, Hardened Steel Parts, Self Lubricating throughout, water and dust proof at twice the price it could be no better. All material and workmanship are the best. It is sold at only a fair margin of profit.

Price for any size wheel with complete fittings.

50 Mile Combination Instruments . . . \$45.00

50 Mile without Odometer . . . 35.00

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Patented in United States October 10, 1900. Patented in Canada,

England and Europe. Other patents pending.

Manufactured by

The R. H. SMITH MFG. CO., Springfield, Mass.

Established 1865

Electrotypes ready for Jobbers' '06 Catalogues

Incorporated 1883



A FACT

That truth is stranger than fiction
is a saying both old and true.

The "wise ones" are using **MONOGRAM OIL**
Why don't you DO SO, TOO?

COLUMBIA LUBRICANTS COMPANY OF NEW YORK
78 Broad St., New York City

AUTOMOBILE TOP FABRICS

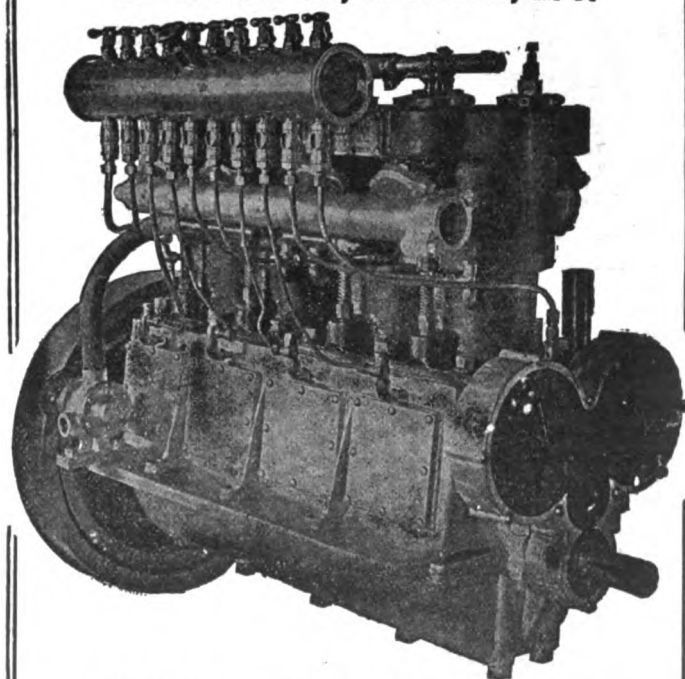
High-Grade and Chase
Rubber Leather
Single & Double Texture
Top Goods.

Complete Assortment
of Fabrics, Colors and Grains

L. C. CHASE & CO.
NEW YORK, BOSTON, CHICAGO.

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AUTO and MARINE ENGINES
AIR and WATER COOLED, 5 to 40 H.P.
TRANSMISSIONS and CLUTCHES

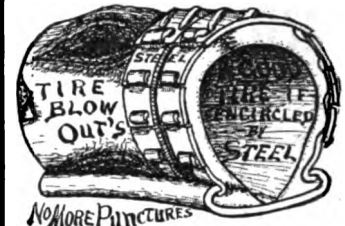


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THE FAMOUS
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Are conceded by all to be the greatest value ever offered. The two models for 1906 contain all the good features of other high-grade cars, besides those important ones found only in the "Rigs That Run." WRITE for catalog—it may save you many dollars. AGENTS IN ALL IMPORTANT CITIES

ST. LOUIS MOTOR CAR CO. - - Peoria, Ill.

Protect Your New Tires. Repair the Old Ones



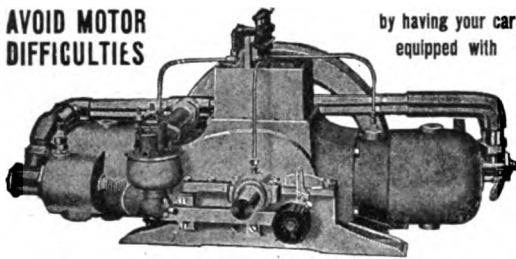
Tires Will Last Forever
Steel Link Bands
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NO MORE PUNCTURES
You can fix Blowouts quick. If tire is completely covered by these clasps you cannot have Blowouts, Punctures, Rim Cuts or wearing off of tire. As flexible as ever.
Tread plates corrugated to prevent skidding.

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AVOID MOTOR
DIFFICULTIES



by having your car
equipped with

BRENNAN MOTORS

The pleasure of automobilism depends upon the motive power; its practicability, smooth running and reliability.

Our motors combine these qualities fully, and are built to withstand the hardest usage. They have been brought to their high standard by years of practical experience, careful design, good workmanship and the best materials.

The above cut shows our double opposed horizontal, rated 16-20 H.P., designed to be used with individual clutch type of planetary transmission, giving two speeds and reverse; or a three-speed and reverse sliding gear may be set if specified. Write for Catalog.

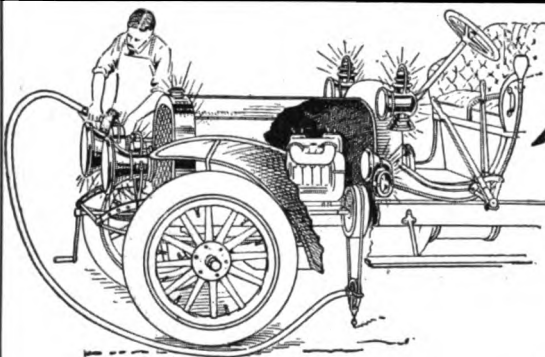
BRENNAN MOTOR COMPANY - Syracuse, N. Y.



How
Is
Your
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Is it getting "wobbly" and missing on high speed? Better get a ZEUS that will last as long as the engine. They cost no more than the poor ones. Also Secondary Distributors.

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COATES
DRILLING
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BUFFING
OUTFITS

Auto or Electrically Driven

ONCE USED, YOU WONDER HOW
YOU EVER DID WITHOUT IT.

Use your engine power, make every piece of brass a mirror. Drills all holes up to half inch. All we ask is a fair trial. Every autoist should own one.

Prices Reasonable.

Send for book 206

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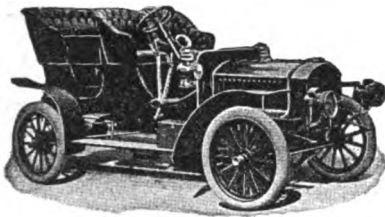
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AUTOMOBILE
CLEAN

Preserves
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Removes
Mud Stains

If your Dealer or Garage does not have Cleanola Auto Clean in stock, write us direct and we will deliver to you a can on receipt of 25 cents



"IROQUOIS" Standard for Quality

Type C. 35 H.P. \$2,250
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"The Pullman of Motor Cars"

Celebrated for its last year's record
Admired for its present perfection
Sold with a brief, comprehensive
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Free of Repairs for One Year

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Make and-Break Spark
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USE COL. SPRAGUE'S AUTO TOPS.

THE SPRAGUE IDEA - MADE THE SPRAGUE WAY
COLONEL SPRAGUE'S FOLDING PLATE GLASS FRONT
THIS SHOWS THE INSIDE WITH THE FRONT FOLDED
DOWN AND LOCKED - IT IS HELD SECURELY AND
CANNOT RATTLE - TO FOLD THE FRONT UP
TURN THE LOCKS AND RAISE THE UPPER SECTION
AND LOCK IT - IT GIVES YOU PLenty OF AIR
WHEN FOLDED DOWN - IT PROTECTS YOU
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A SPRAGUE TOP - IT CAN BE FITTED TO ANY CAR.
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THE SPRAGUE UMBRELLA CO.
NORWALK, OHIO.

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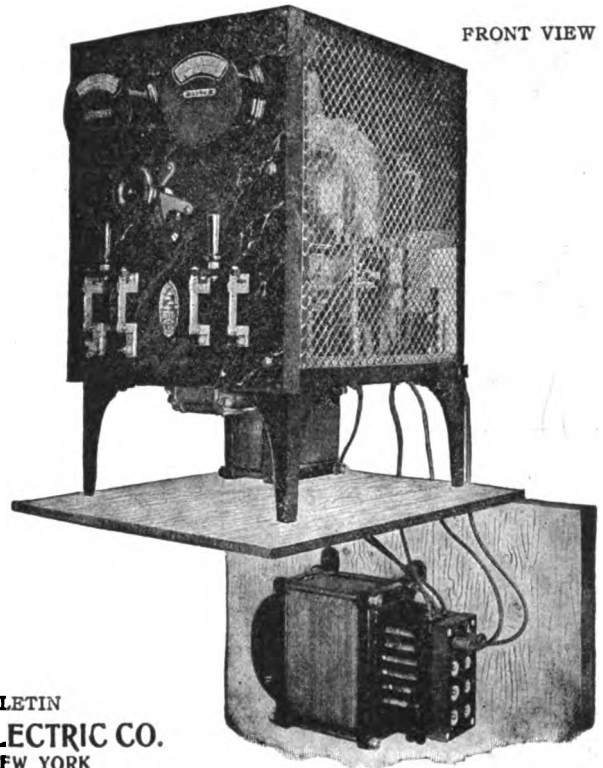
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For Charging STORAGE BATTERIES

From the ordinary
Lighting Alternating
Current.
Can be installed
in any garage
or private
automobile house.
No expert
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required to operate.
Automatic starting.
High Efficiency.
Economical.

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COOPER HEWITT ELECTRIC CO.
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"The Hoffecker" Speed and Mile Register

There Are None "Just as Good"



The Chauffeur can
read it with sand in
his eyes.

In addition to giving the miles
per hour it gives the miles per trip
from 1 to 100 with an indicating
hand that is easily turned back to
zero when desired, ready for an-
other trip. The season's total mile-
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shown on one dial that is plain and
distinct, and can be read at a glance.

The Hoffecker Speed and Mile Register Is Positive
every time

"THERE IS NO GUESSING"

"The Hoffecker" Speed and Mile Register Co.

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BOSTON, MASS., U. S. A.

KRUPP SPECIAL CHROME NICKEL STEEL
Grade E. F. 60.0

Now in Stock at New York.

Round bars $\frac{1}{2}$ inch to 8 inch diameter, each about 10 feet long. This steel can be used unhardened, having Min. Elastic Limit 95,000 lbs., Min. Tensile Strength 110,000 lbs., Elongation 16 per cent., and Contraction 67 per cent., or can be case-hardened or hardened in oil to have more than double the above Elastic Limit and Tensile Strength.

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KRUPP STEEL—THE BEST FOR MOTOR CARS, BOATS, ETC. THOS. PROSSER & SON, 15 GOLD ST. N.Y.

The TUBAPHONE
The NEW Exhaust-Sounded Auto Horn

Save Money—Get the Best

A melodiously deep and clear musical sound. No solder—just bolts. No blast too hot to affect it. One, two, three or four tubes—oxidized, full nickel or brass finish. Most moderate priced of any horn made.

Guaranteed to give entire satisfaction. Write for full information and prices.

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Dealers will find this horn easy to sell and profitable.

Why Buy Imported Timers



when you can buy the best and most durable one in America with a year's guarantee, made to last and not taken apart every few months to replace some weak parts or burned out contact point? The patented terminal is one which we call your special attention to; it does away with trouble arising from loosening of nuts, screws and broken wires. Send for catalog which gives you full description.

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Makers of Auto and Motor Boat Engines
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ZENITH SPARK PLUG PROTECTOR



- ☐ Prevents fouling of spark plugs, and cracking of porcelains.
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- ☐ The "Zenith" Spark Plug Protector will pay for itself many times over in the saving of plugs.
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ZENITH NOVELTY WORKS
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The Cambria Forge Co.
SUCCESSORS TO THE HUSSEY DROP FORGE CO.

Manufacturers of

Drop Forgings and Hussey Automobile Specialties

STEERING GEARS, UNIVERSAL JOINTS, STEERING WHEELS, ADJUSTABLE LAMP BRACKETS, AUTOMOBILE AND STEEL CAR FORGINGS



1907 Steering Gear Model Ready
Send Blue Prints for Estimates

FACTORIES
Johnstown, Pa. Cleveland, Ohio

Spicer Universal Joints

Are fully covered by United States

PATENTS

No. 728,779, dated May 19, 1903
" 768,407 " Aug. 23, 1904
" 806,592 " Dec. 5, 1905

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PROMINENT
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THE
PUBLIC
EYE**



**HIGHEST TYPE
OF
IGNITION
BATTERY
MADE**

Manufactured by
NATIONAL CARBON COMPANY
Cleveland, O.

"National

National Battery Company



Sparkers"

Buffalo, New York



BALDWIN AUTOMOBILE CHAINS

Our Riveted Chain has the best construction of any made. We have a special feature for attaching the side link to the rivet which makes it stronger than any other Chain. Send for sample and see our construction.

BALDWIN CHAIN & MFG. CO., 194 Chandler Street, Worcester, Mass.

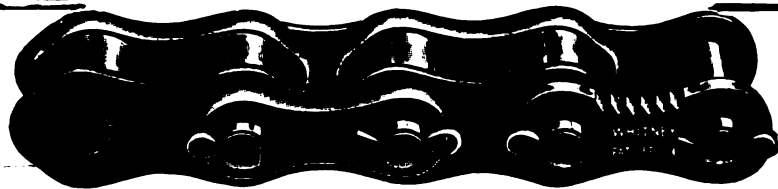
Western Sales Agent: Henry V. Greenwood, 166 Lake St., Chicago, Ill.

Agents for Chains: Utility Co., 332 Broadway, New York, N. Y.

LOCKE & COMPANY AUTOMOBILE BODIES

**218-220 WEST 84th ST.,
NEW YORK.**

**WITHOUT PARALLEL IN THIS COUNTRY OR ABROAD
COMBINE EXTREME ELEGANCE, MOST REFINED
DESIGNS AND UNEXCELLED DURABILITY**



The WHITNEY MFG. CO., Hartford, Conn.

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"Adams-Farwell," "Adams Vehicle Co.," "American Motor Truck," "Auto-Car Equipment," "Baker," "Berkshire," "Biddle-Murray," "Cadillac," "Columbia," "Champion (McCrea)," "Crown," "Crawford," "Columbus Buggy Co.," "Elwell-Parker," "Ford," "Franklin," "Gaeth," "Gale," "Grout," "Hewitt," "Iroquois Iron Works," "Knox," "Lambert," "Matheson," "Mack Brothers," "Mitchell," "Moline," "New York Motor Truck," "Olds," "Packard," "Rambler," "Rapid," "Reo," "Stearns," "Thomas," "Tourist," "Vehicle Equipment," "Wayne," "Western Motor Truck," "Windsor," etc.

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If a high grade 1906 touring car is fitted with Garford parts the quality of its structural work becomes self evident. If it isn't, more elaborate proof will be needed to establish its position in the market. We cannot accept further orders this season. Next year, however, the capacity of our factories will be largely increased.

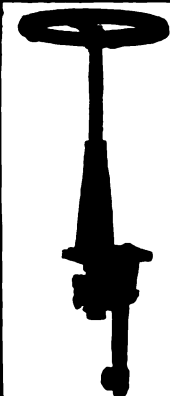
MOTOR WAGON PARTS

We can promptly execute orders for steering gears, brakes, sprockets, motor hangers, and other parts for motor wagons. They are suitable for all classes of commercial power vehicles, from the lightest to the heaviest. They are not "freak" components of a wonder working vehicle. They enjoy the rare distinction of having been thoroughly tested for some years past in the most varied and severe kind of commercial service. Circulars 2, 3, 5, 10 and 11 give information concerning them.

THE GARFORD COMPANY

ELYRIA, OHIO

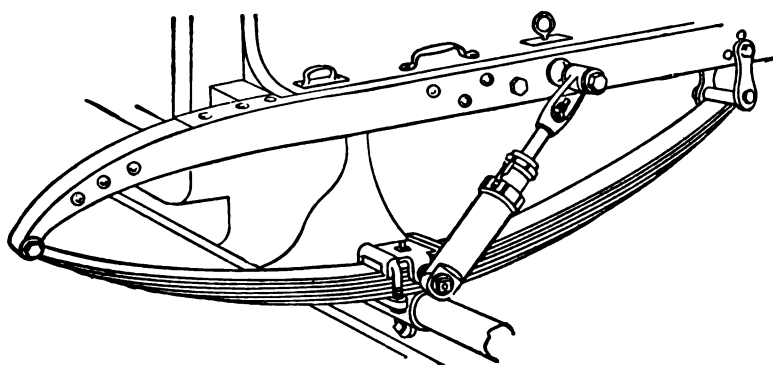
Sales Manager: HAYDEN EAMES, CLEVELAND, OHIO.



Pinion and Sector
type also supplied



Made in three sizes



The American Hydraulic Shock Absorber

Allows the springs full play on smooth roads, and makes it impossible to break them on rough ones.

Thirty Days' trial and money refunded if not satisfactory.

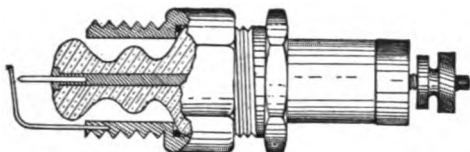
For full particulars, write

AMERICAN SHOCK ABSORBER CO.
EASTON, PA.

ARC-SPARK MFG. COMPANY

Makers of the

W. E. B. PLUG



All Dealers sell it. Address

ARC-SPARK MFG. COMPANY

Dept. B, 125 W. 32d St., NEW YORK

THE R. M. CORNWELL CO., Inc.

Makers of Gasoline Engines

SYRACUSE, N. Y., May 28, 1906.

Arc Spark Mfg. Co.,

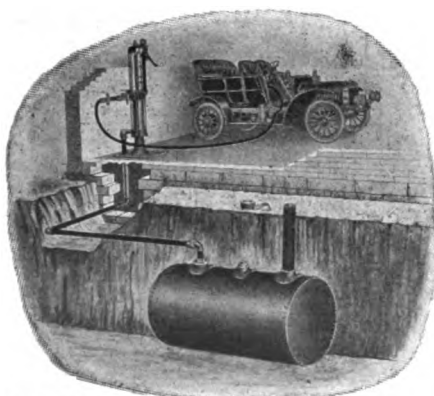
N.Y. City

Gentlemen:-

We received your sample plug, and have put it to as severe test as we know of in our factory, and we find the same to be O.K. in every respect. It does not sputter, and substantiates every claim you made for it. We are still testing the same and expect to use a large number of them. We have heard using it principally where other plugs have failed.

Yours very truly,

R. M. Cornwell
THE R. M. CORNWELL COMPANY
Syracuse, N. Y.



Cut 41. The Standard Garage Equipment for Gasoline Storage

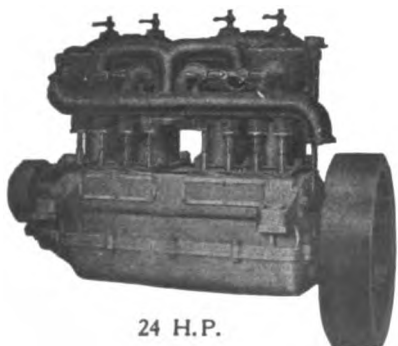
Ten Bowser Advantages

- 1—Eliminates danger.
- 2—Draws gasoline in one tenth of the time ordinarily required.
- 3—Evaporation, leak and waste proof.
- 4—Keeps gasoline from deteriorating.
- 5—Pumps and measures at the one operation. No lost time.
- 6—Measures gallons, half-gallons or quarts as desired.
- 7—Does away with the use of funnels, measures and cans.
- 8—An underground tank built to last a lifetime.
- 9—Tank buried in the most convenient place, regardless of the location of the pump.
- 10—All metal durable pump placed inside the garage.

SEND FOR CATALOG J.

S. F. BOWSER & CO., Inc., - Fort Wayne, Ind.

Eastern Office, 255 Atlantic Avenue, Boston, Mass.



24 H.P.

BEAVER MOTORS-The Perfect Power

Highest efficiency, simplicity of construction, perfect lubrication, and uniform performance, are some of the reasons why you should use our motors. We are equipped to furnish these motors on a manufacturer's, not a builder's, basis. This guarantees low cost and interchangeability of parts.

2 Cylinder Opposed,	-	-	12 Horsepower, Type U
2 Cylinder Opposed,	-	-	18 Horsepower, Type T
4 Cylinder Vertical,	-	-	24 Horsepower, Type R

BEAVER MFG. COMPANY

Milwaukee, Wis.

The "N.I.R." **COLLAPSIBLE AUTOMOBILE PAIL**
For Water or Gasoline



Made of Rubber
Folds up Flat
Strong Durable

It's light and easy to handle, and you can pour from top or bottom. The valve in the bottom works automatically.

PRICE, \$2.00

We also make an Auto Shirt, Repair Tape and Rubber-treated Fabrics (sold by the piece only) for Automobile Topping, and all have

OUR TRADE-MARK
N. I. R.
National India Rubber Co.
BRISTOL, R. I.
SELLING AGENCIES
43-45 Pearl St., Buffalo
84 Lake St., Chicago
409 W. Lombard St., Baltimore

PAIL FULL

"ACORN"
GASOLINE SEPARATOR



A device to thoroughly eliminate all water and dirt from gasoline. May be placed anywhere in the supply pipe between the gasoline tank and carburetor. Works admirably on autos and motor boats, as most of the troubles laid to faulty carburetors and ignition troubles are due to water and dirt in the gasoline. This device weighs 4 ounces only, and can be attached in a few moments to any auto or motor boat. Satisfaction Guaranteed. Price, \$2.50. Special prices to trade or in quantity.

E.P. CLARK, M.D. 16 ARCADE, UTICA, N.Y.

CHICAGO & ALTON RAILROAD



"THE ONLY WAY"
CHICAGO - ST. LOUIS
KANSAS CITY
AND POINTS BEYOND

GEO. J. CHARLTON, GENERAL PASSENGER AGENT
CHICAGO, ILLINOIS.

"LIGHTNING"
FIRE EXTINGUISHER



Composed of a Combination of Dry Chemicals of Absolute Permanency.
SURE DEATH TO GASOLINE FIRE.

READ THIS: OFFICE OF DR. J. F. TRUE & CO. Auburn, Me., May 22, 1906.

SUFFOLK CHEMICAL CO., Boston, Mass.

Dear Sirs: Please send us by Boston and Lewiston Express at once, 4 dozen of your **LIGHTNING FIRE EXTINGUISHERS**. The writer saw one of these prevent a bad fire in an Automobile yesterday going through Beverly and determined to have one or two handy for himself.

Yours very truly,
DR. J. F. TRUE & CO.
(Signed) E. C. True, Manager.

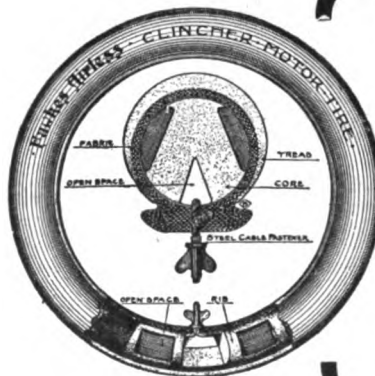
Fire is liable to happen at the most unexpected times on the road or in the garage. Insure your car with the **Lightning Fire Extinguisher**.

PRICES:
Short tube, 20 inches, for Carrying in Car, \$1.00
Long tube, 24 inches for Garages, \$1.50

GARAGES It is to your interest and your duty to your customers to provide fire protection. As a **Special Offer** for the next 30 Days we will sell you the **Lightning Fire Extinguisher**, f. o. b. Boston, at \$8.00 per dozen.

ABSOLUTELY SURE. Cheapest Insurance in the World.

THE SUFFOLK CHEMICAL CO.
171 Summer Street BOSTON, MASS.



End Your Tire Troubles

Let punctures, explosions, cutting and coming-off be a thing of the past for YOU. It is for thousands. Try the

FAWKES AIRLESS CLINCHER MOTOR TIRE

on your machine **TEN DAYS FREE**. It isn't a solid tire, it isn't pneumatic. It's the perfect tire. The tire you've been looking for. It's sold under the broadest guarantee on earth. Write for our book—the Fawkes book on "tire troubles." **IT'S FREE**. A live agent with an auto wanted in each community. Milwaukee Rubber Works Co., 35 MacMillan Av., Cudahy, Wis.

Grinnell "Ventilated"
(Patent Pending)
Automobile Glove



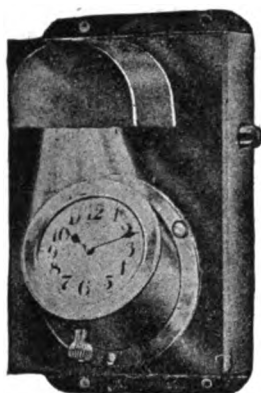
Here is a glove that will keep your hands cool and prevent perspiration. The perforations in back and fingers give perfect ventilation, keep the hands cool, give elasticity to the gloves and free use of hands and fingers. Dirt can't get in, and no sagging with the "Rist-fit" gauntlet. The gloves are made of "Reindeer" leather, the same stock that we put into our famous Engineers' gloves—soft, pliable and washable. Will outwear a half dozen of the ordinary kind.

Sent On Approval

We want to prove to every automobilist that the Grinnell "Rist-fit" "Ventilated" are the best Automobile Gloves made—better than the kind that sell for \$5.00 to \$10.00 a pair. Tell us your size and your dealer's name and we will send you a pair on approval.

Morrison, McIntosh & Co.
Makers 66 Broad St., Grinnell, Iowa

"Rist-fit"
Keeps Your Hands Cool—Stays Up
Let us send you a pair **FREE** for examination.



AUTOMOBILE ELECTRIC Dash Light and Clock

No wiring necessary
Size of box in Brass 5x3½ inches

R. E. BROWN,
30 Vincent Street, CLEVELAND, O.

Separate lights for Speedometers.
Discount to the trade.

"Columbia Lamps and Generators are noted for their simplicity, efficiency and handsome appearance. They are made on honor and are fully guaranteed. Nothing shoddy about them. We are one of the oldest manufacturers in the business."

WRITE FOR CATALOGUE AND PRICES

HINE-WATT MFG. CO.

58-60 WABASH AVE.
Chicago, Ill.

Aerocar



MODEL A, 1906—24 H.P., Four-cylinder, Air-cooled. Delivered promptly, complete in every detail of equipment as shown in illustration, including Standard Extension Black Top, Two Gas Headlights, Full Oil Lamp Equipment, Prest-o-Lite Tank, Hartford Shock Absorbers, Gabriel Horn, Speedometer, Extra Tire and Inner Tube in Waterproof Case with attaching Irons, Robe-rail and Foot-rest in Tonneau, Tool Box with full equipment on Running Board.

\$2,800 f. o. b. Detroit

Price with Lamp Equipment, \$2,500

The motor car of greatest flexibility—awarded First Prize for flexibility at the Open Air Show and Carnival at the Empire City Track, New York, May 24, 1906, and there were sixty contestants.



THE AEROCAR COMPANY

Detroit, Mich., U. S. A.

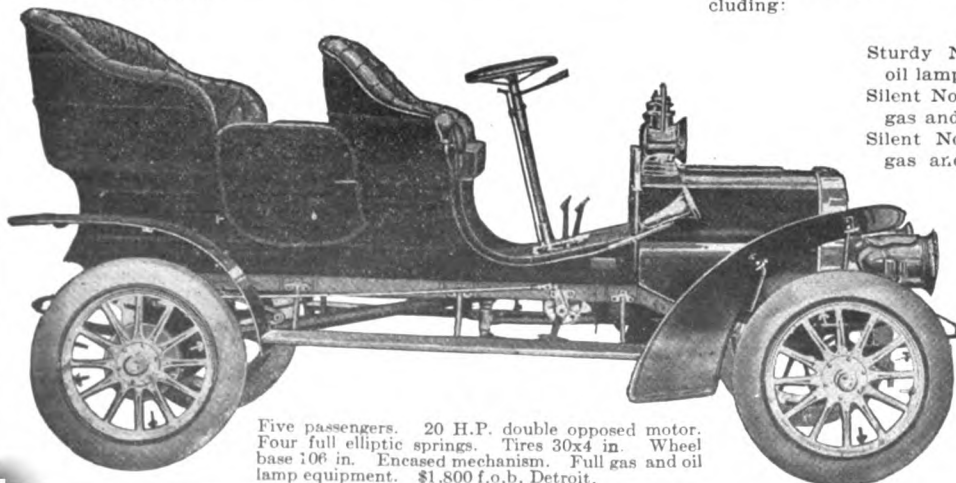
Members of American Motor Car Manufacturers' Association

NORTHERN

Safe, Silent and Dustless

The Silent Northern has all the power needed for touring in this country or any other.

Its double opposed motor—cylinders 5½ in. bore by 5¼ in. stroke—develops 20 horsepower, PLUS—and the power is all usable—all practical. No loss in transmission and no waste in vibration. It is all delivered direct to the wheels. The transmission gear is placed directly on the crankshaft and the crankshaft runs direct to the rear axle with only one universal joint between. No belts—no chains.



Five passengers. 20 H.P. double opposed motor. Four full elliptic springs. Tires 30x4 in. Wheel base 106 in. Encased mechanism. Full gas and oil lamp equipment. \$1,800 f.o.b. Detroit.

And the Northern double opposed Motor is perfectly balanced, it operates smoothly and noiselessly—the riders enjoy solid comfort. But the motor is not the only thing about the car—we challenge comparison on simplicity of mechanism, luxury of upholstery, finish, style, noiselessness, accessibility and simplicity of control. Only compare and you will buy the Silent Northern.

Let us send you new Catalogue illustrating our full line, including:

Sturdy Northern Runabout, 7-h.p., with oil lamp equipment	\$ 650
Silent Northern Touring Car, 20-h.p., with gas and oil lamp equipment.....	1,800
Silent Northern Limousine, 20-h.p., with gas and oil lamp equipment.....	2,800
Model "K"—30-h.p., four-cylinder car—air controlled and with air-brakes, full gas and oil lamp equipment..	\$3,000

Northern Manufacturing Co.,

DETROIT, U. S. A.

New York City Agent, Peter Fogarty, 142 West Thirty-eighth St.
Chicago Agent, Northern Motor Car Co., 1449 Michigan Ave.

The Incomparable
WHITE
 The Car for Service



TIRE ECONOMY.

Every motorist knows that up-keep of tires is, in the case of most cars, a heavy item of expense. The testimony of all critical observers, including those in the tire trade, is that White cars have far less tire trouble than any other make of touring car. This great advantage is due partly to the fact that the White starts without jerk or jolt and that changes of speed are effected gradually without any sudden strain on tires and machinery. Another factor reducing tire expense on the White to a fraction of that on other cars is that the White glides along smoothly and absolutely without vibration. In other words, the only jolts to which the tires are subjected are those of the road.

As an experienced motorist has expressed it, "The wear on tires on the White car is all from beneath and none from above."

Write for our new testimonial pamphlet.

WHITE SEWING MACHINE COMPANY
 CLEVELAND, OHIO

"Toledo"
Type X, 20 h.p., \$2500

The Highest Point of Perfection

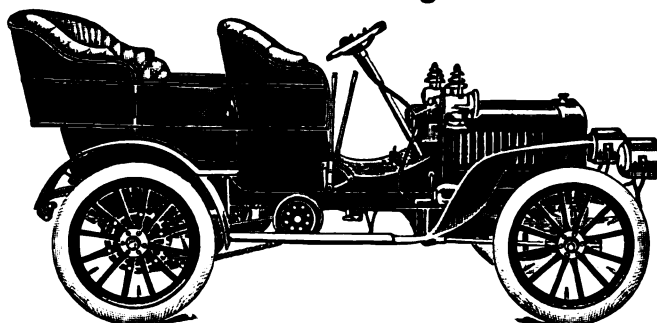
IF you want a thoroughbred 4-cylinder car of great power, speed and endurance that you can handle yourself, and that will be easy on your pocketbook, your choice should be the **TYPE X, POPE-TOLEDO**.

Never before have we placed on the market a car so thoroughly adapted to the extreme conditions encountered in all-around touring on American roads, embodying at the same time all the features which make it desirable for city use.

The motor of Type X was originally designed to develop about 20 h. p., but it has proven on the brake capable of developing 25 h.p. It has been proven that it will negotiate on its high speed gear some hills over which much larger and more powerful cars would be obliged to run on first or second speed.

The car has a speed of 45 to 50 miles an hour; has smooth and quiet running qualities; seating capacity, 5; is very economical on tires, and its control is simplicity itself.

Write for Catalogue.



POPE MOTOR CAR CO.

TOLEDO, OHIO

NEW YORK CITY - - - - 1733 Broadway
 BOSTON - - - - 223 Columbus Avenue
 WASHINGTON, D.C. - - 819 Fourteenth St., N.W.

Members Association of Licensed Automobile Manufacturers.

CONTINENTAL

TIRES are sold at the same price (5 inch sizes) and about 10% advance over American makes. Most people have been led to believe that our prices were double or treble.



Moline

TWO STYLES,
THREE SIZES OF GASOLINE AUTOMOBILES

FOUR-CYLINDER, 30-35 H.P.	FOUR-CYLINDER, 18-20 H.P.	TWO-CYLINDER 16 H.P.
\$2,500	\$1,750	\$1,000

GET A COPY OF OUR CATALOGUE

Moline Automobile Company,
EAST MOLINE, ILL.



Put on or take off your
tire in five minutes
without help and effort
with the

"L & M" Tire Adjuster



the only ring tire adjuster on the market. Why does it take so much time and effort to put your tire on? Because the contraction of the tire at one point when you press the ring into place, forces it out at all other points. The "L & M" Tire Adjuster will overcome this difficulty. It will also enable you to remove your ring with ease when it sticks to the tire. It consists of six tools which are slipped over the tire at intervals, and by turning crank the tire is forced back from the ring all the way round, thus enabling you to put on or take off the ring with ease. The "L & M" Adjusters are sold at \$5.00 per set delivered. In two sizes:

No. 1—To fit any tire up to 3½ inches.

No. 2—To fit any tire up to 3½ to 5 inches.

Write for illustrated booklet. Leather carry bag, \$2.50 extra.

THE LONG & MANN CO., 521 Central Building, Rochester, N. Y.

Northwestern Storage Batteries

ACKNOWLEDGED THE STANDARD
of Automobile batteries. Guaranteed to give a greater output, pound for pound, than any other battery on the market. DURABILITY, second to none. Both Ignition and Propulsion Batteries. If you are having battery trouble let us help you out, as we have hundreds of others. Write for catalogue and prices.

Northwestern Storage Battery Co.
Stephenson Building Milwaukee, Wis.



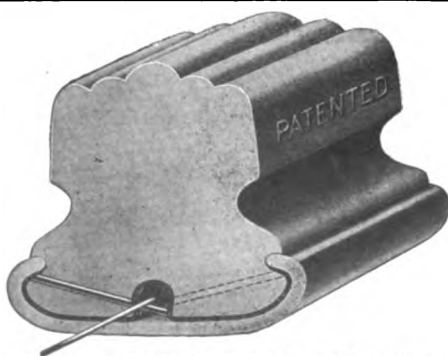
Don't Scratch the Varnish

Ideal Carriage Washer

The original—all imitations are inferior—cleans auto or carriage quickly and perfectly—positively will not scratch varnish. Water flows through sponge, fits any hose connection, made of solid brass, will last a lifetime. Saves time and labor and prevents clothing from getting wet. Send for it now. Money back if dissatisfied. Price \$3.00 prepaid.

Send for Booklet D.

IDEAL CARRIAGE WASHER, 94 Lenox St., Rochester, N. Y.



SWINEHART

THE PROVEN SUCCESS

Manufacturers are adopting it, some as exclusive equipment, with cars guaranteed same as on pneumatics.

The tire that stood the test for three years and has its first customers as its best friends.

THE SWINEHART CLINCHER TIRE & RUBBER CO. - Akron, Ohio

CHICAGO: 1231 Michigan Ave.
BUFFALO: 893 Main St.

NEW YORK: 1843 Broadway.
DENVER: 1558 Broadway.

DETROIT: 230 Jefferson Ave.
MINNEAPOLIS: 1600 Sheridan Ave., N.

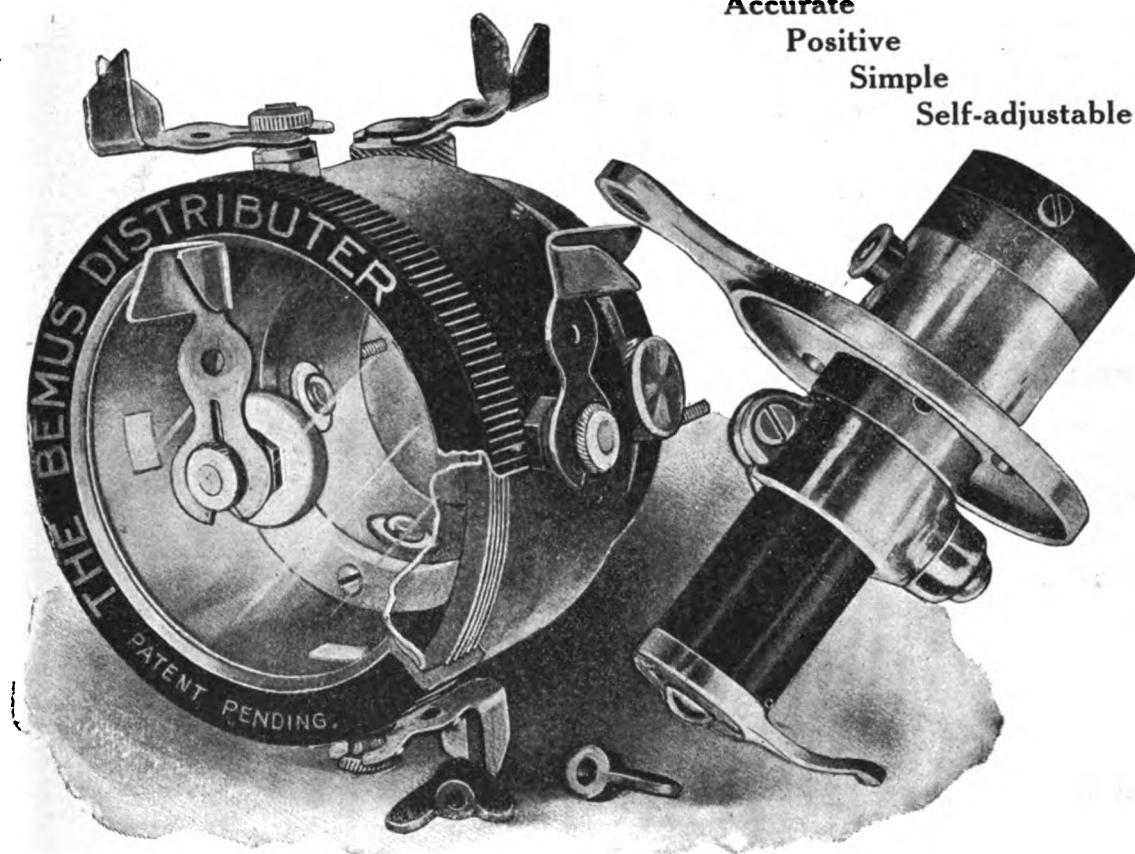
BOSTON: 97 Haverhill St.
PHILADELPHIA: 711 N. Broad St.

YOUR SPARK

GUARANTEED
BY USING THE NEW

"BEMUS" Twin Ball High Tension Distributer

Accurate
Positive
Simple
Self-adjustable



Original Features

1. Twin (double) Ball Primary Contact.
2. Foreign matter between points of contact impossible.
3. A spring located back of each ball does away with all inertia.
4. Primary contacts being made of Standard Steel Balls are easily renewable with slight expense.
5. Its construction enables us to GUARANTEE against EARLY or LATE ignition, making it POSITIVELY ACCURATE.
6. IT WILL NOT SHORT-CIRCUIT.
7. ONLY ONE COIL necessary for any number of cylinders.

IN ORDERING, STATE SIZE OF TIME SHAFT AND NUMBER OF CYLINDERS

MANUFACTURED BY

T. ALTON BEMUS, 294 Washington St., BOSTON, MASS.

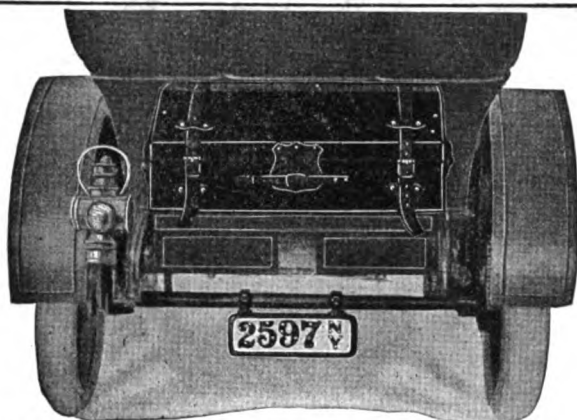
30-day Offer

We will ship to Motor Car Builders ONE "BEMUS" Distributer to try out on 1907 Experimental Cars on request.

New circular gives full details and PRICES.

Write to-day. Liberal discount to dealers.

AUTOMOBILE TRUNKS



BEFORE purchasing a hamper for your car you should call and see a few of the many styles which we manufacture. All of them are made of sole leather with patent leather finish and are absolutely dust and water proof. In writing state style of car.

Number pads, lamp numbers, and tool kits.

Catalogue mailed on application.

JOHN BOYLE & COMPANY

Manufacturers of High-grade Leather Auto Trunks, License Hangers, Lamp Numbers, Auto Tool Kits, etc.

112-114 DUANE ST. - - NEW YORK CITY

SUPREMUS CARBURIZERS



What their name implies. Adjustable to all conditions. Entirely automatic. All adjustments can be made while engine is running. Mixture is controlled from seat of car.

THE "LUNGS OF THE MOTOR"

WILL DO what others cannot do, give an even, perfect, exact mixture under all road and load conditions.

ABSOLUTELY GUARANTEED

MOTOR COMPONENTS MFG. CO., Des Moines, Iowa.

Our 3-inch Radiator keeps a 4-cylinder, 2-cycle engine cool at 2,000 R.P.M.

3 TIMES MORE RADIATING SURFACE THAN ANY OTHER COOLER.

Tubes of seamless copper. Each tube expanded in plates. Corrugated metal insertions in each tube.

100 TIMES STRONGER THAN SOLDER

PROOF AGAINST VIBRATION

ARCTIC RADIATORS

SMITH Pressed Steel Frames

== HEAVY STAMPINGS OF ALL KINDS ==

Factory Capacity Doubled—Contracts Taken for Any Standard Frames in Any Quantities for

IMMEDIATE DELIVERY

Special Frames on Order in Quantity
Send Blue Print for Estimate

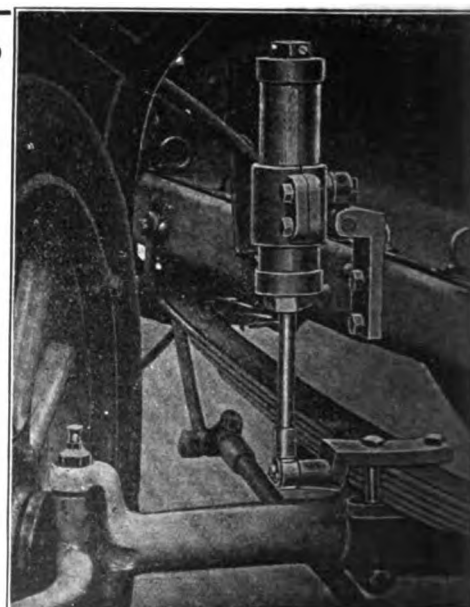
Rear Axles, Front Axles,
Pressed Steel Hubs,
Transmission Gears, Clutches,
Etc., Etc.

A. O. SMITH COMPANY

Park, Clinton and Virginia Sts.
MILWAUKEE, WIS.

"AUTO" RIDE ON AIR

Perfection Air Cushions for Automobile Springs



MOTOR—With ease and comfort.
ABSOLUTE SHOCK ABSORPTION on rough roads.

NO VIOLENT RECOIL—but perfect ease in the regain of the original position of the springs.

SIMPLICITY in operation. IMPOSSIBLE TO GET OUT OF ORDER—no oil, no levers, simply a self-adjusting cushion of air between the car and every jolt or jar of uneven roadway.

DURABILITY—Since the AIR alone sustains the SHOCK there is no WEAR and TEAR on costly machinery and the supply is inexhaustible and furnished free of cost by nature itself.

NO BROKEN OR FLAT SPRINGS.

Patented Aug. 8, 1905.

Write for prices.

THE SHEDDAN MANUFACTURING CO.,

138 W. Fayette St., Baltimore, Md.

New York Office:
1771 Broadway

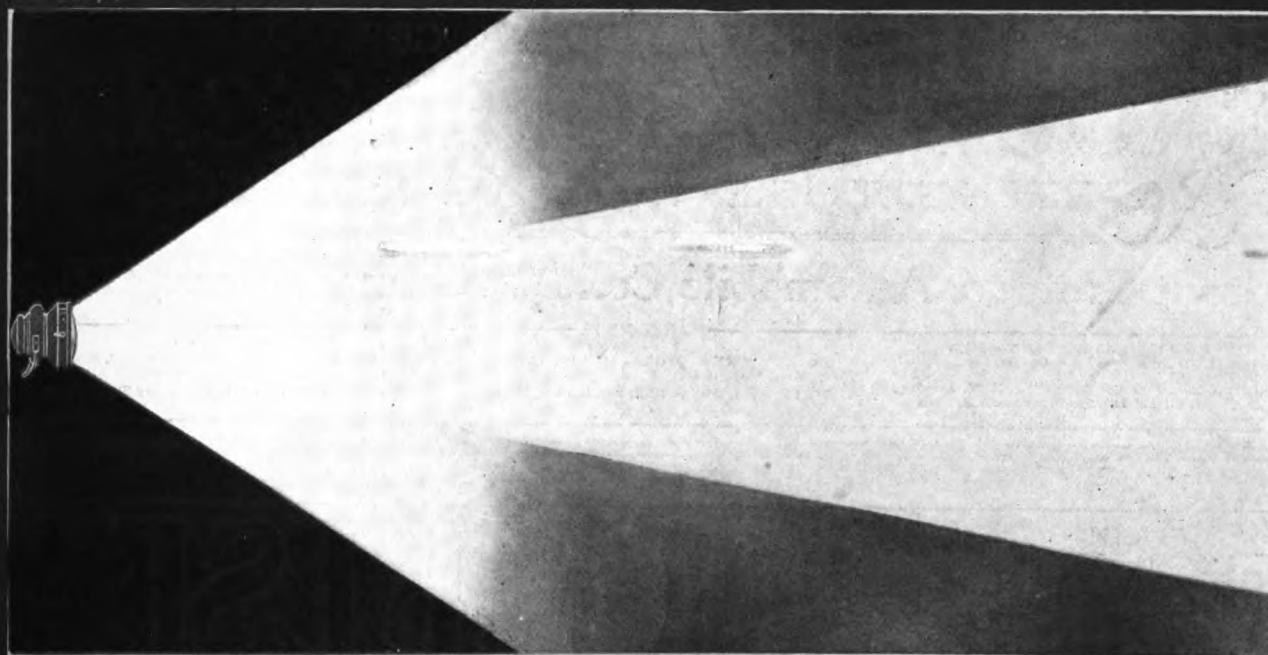
Philadelphia
Quaker City Auto Co., 238 No. Broad St.

AUTOMOBILE

WEEKLY

NEW YORK—THURSDAY, JUNE 28, 1906—CHICAGO

10 CENTS



FROM PHOTO OF BEAM OF LIGHT FROM NO. 55 LAMP.



GIVES MOST LIGHT—PROJECTS IT FURTHER

A little investigation of the light problem will establish the fact that our lamp, styles No. 50, No. 55 and No. 56, will satisfy those who want the very best lamp that money can buy.

As shown in the above illustration the back reflector is focused to give a "pencil" or long distance ray for showing the road far in advance, and the front reflector focused to give the "fan" ray and light up the immediate vicinity of the car.

It gives more light—gives a brighter light—projects it further—and is superior in every way.

Our firm policy in using the finest material, designed and manufactured under our personal supervision by skilled workmen in accordance with the best methods known in modern practice, and a reasonable price for our product, is the paramount factor in building the largest lamp business in the world. Our great factories have the largest output, our facilities are unlimited, and our promises of delivery dependable.

THESE ARE REASONS WHY

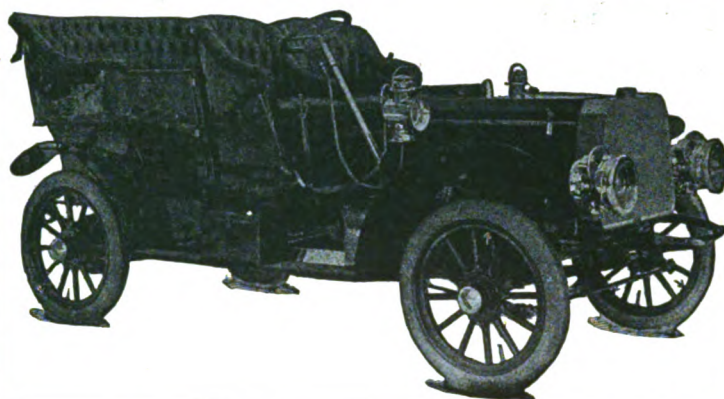
GRAY & DAVIS LAMPS

STANDARD OF THE WORLD

The Automobile Age

GRAY & DAVIS, AMESBURY, MASS.

The
Car of Quality
and
Simplicity



30-35 H.P.
\$2,500

SOME CARS WILL BE AS GOOD AS
GROUT GASOLINE CARS
WHEN BUILT LIKE THEM, BUT NOT UNTIL.

Grout Brothers Automobile Co. Main Office and Works: **Orange, Mass., U.S.A.**

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A. T. WILSON, 1558 Broadway, Denver, Colo.
L. D. TAYLOR, Brattleboro, Vt.
GROUT BROS. AUTOMOBILE CO., H. W. Lansing,
Manager, 311 Third St. South, Minneapolis, Minn.

20th CENTURY MOTOR CAR CO., 1421 Michigan
Ave., Chicago, Ill.
WHITNEY & CONVERSE, Wincendon, Mass.

J. A. PETREE, New Haven, Conn.
CURTIS, HAWKINS CO., Motor Mart, Boston, Mass.
H. K. DODGE, Glen Cove, N. Y.
P. H. JOHNSTON CO., 267 Halsey St., Newark, N. J.

The Celebrated

CHELSEA AUTO CLOCKS

8 Day High Grade Clocks
"BEST in the WORLD"

Clocks built with a view to stand the jars and
jolts and rough riding of Automobiles. Rep-
utation the highest.

2 3/4 in. "Special" Auto Clock,
"Best in the World" \$36.00

YOU OWN A GOOD MOTOR CAR?

BUY THE BEST CLOCK

The sizes are the approximate diameter of
the dials. —All are in Duplex (patent applied
for) Cast Polished Brass Cases, the most
thoroughly water-proof case on the market.
The 2 3/4 in. "special" shows dial on an
angle, and has locked case. The 3 1/2 in.
"Motor" is a strong, reliable clock.

You want the Best?
Ask for the "Chelsea."

Chelsea Clock Co.

16 State Street, Boston

Makers of Exclusively 8 Day High Grade
SHIP'S BELL CLOCKS, MARINE CLOCKS
AND AUTO CLOCKS.



The below in
Round Cases.

2 1/2 in. Auto Clock, \$26.
3 1/2 in. " " 28.
3 1/2 in. Motor Clock, 24.



Announcement

"STANDARD ALLOY STEEL BALLS" made of ALLOY STEEL will be ready for delivery by or before June 1st.

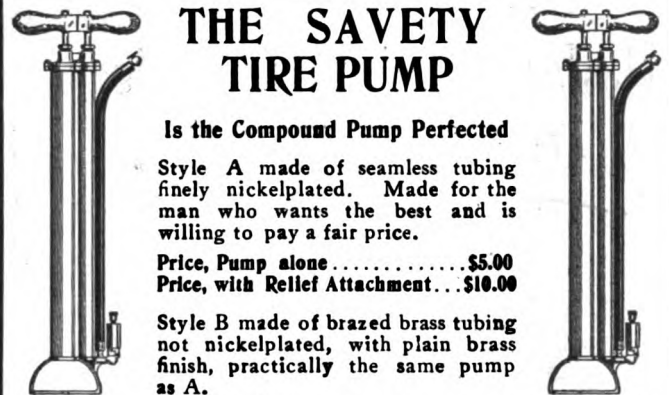
**DOUBLE CRUSHING STRENGTH
ORDINARY BALLS.**

3-4 inch Crucible Steel Balls, crushing strength 50,000 to 56,000 lbs.
3-4 inch "STANDARD ALLOY" Steel Balls, 95,000 to 100,000 lbs.
Guaranteed true to .0001 inch in diameter and sphericity.

PRICES QUOTED ON REQUEST.

Standard Roller Bearing Co.

48th Street and Girard Avenue, Philadelphia



THE SAVETY TIRE PUMP

Is the Compound Pump Perfected

Style A made of seamless tubing finely nickelplated. Made for the man who wants the best and is willing to pay a fair price.

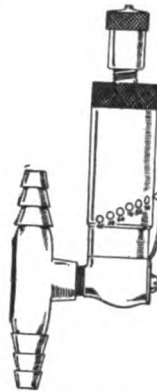
Price, Pump alone\$5.00

Price, with Relief Attachment...\$10.00

Style B made of brazed brass tubing not nickelplated, with plain brass finish, practically the same pump as A.

Price, Pump alone\$4.00

Price, with Relief Attachment.....\$6.00



THE SAVETY Universal Relief Valve

can be used on any pump. You can set it at any desired pressure. You can't get more than that pressure in your tire.

Price, of No. A Relief\$5.00

Price, of No. B Relief\$3.00

The Savety Universal Pump Connection perfect in every detail. You cannot use a gauge or relief valve without one. Holds the tire valve open while you are pumping.

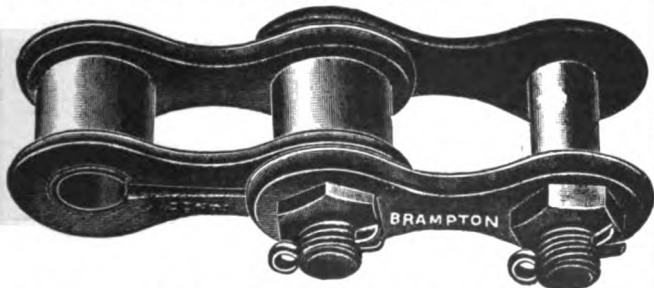
Price 25 Cents

ARTIZAN BRASS CO.

116 Michigan Street, Chicago

LARGE SALES

make it possible for us to import the Celebrated Brampton chain from England (paying freight and duty) and sell it at the same price at which the several other automobile chains are sold to manufacturers, jobbers, dealers and users.



LARGE SALES and SMALL PROFIT with thousands of satisfied customers is our best advertisement.

The Brampton chain is made of self-hardening steel; the strongest chain in the world. All parts polished; fits sprocket without friction.

All standard sizes in stock to fit American and foreign cars at same price as the other chains.

Special chains to fit the Indian motor-cycle.

1906 catalog mailed upon request; the largest catalog of its kind ever issued.

CHAS. E. MILLER

Manufacturer, Jobber, Exporter and Importer

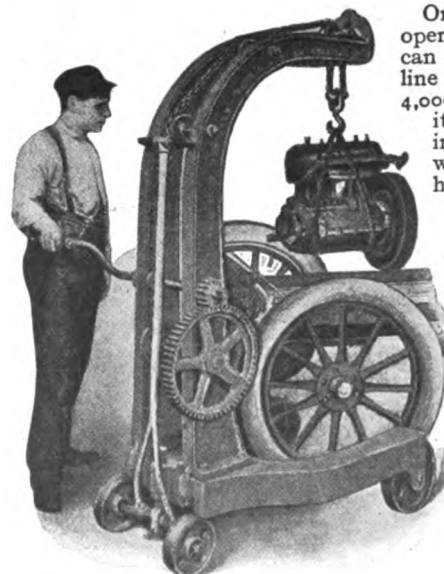
Home Office: 97-99-101 Reade St., NEW YORK

BRANCHES

934 Eighth Ave. 318 and 330 N. Broad St. 308 and 304 Columbus Ave.
New York City Philadelphia, Pa. Boston, Mass.
406 Erie St. 227 1/2 and 229 Jefferson Ave. 824 Main St.
Cleveland, O. Detroit, Mich. Buffalo, N. Y.

THE FRANKLIN PORTABLE CRANE AND HOIST

Indispensable in the economical operation of
Automobile Garages and Repair Shops



One of these Cranes operated by one man can do anything in the line of hoisting up to 4,000 pounds, and can do it easily without calling a man from other work to "lend a hand."

**It is a Wage
Saver and a
Labor Saver**

A great advantage is its compactness. Takes up practically no room.

We solicit a thorough investigation of the merits of this crane.

Write for interesting booklet and special prices

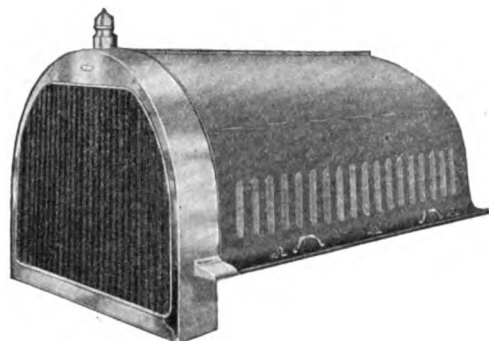
THE FRANKLIN PORTABLE CRANE & HOIST CO.

FRANKLIN, PENNSYLVANIA

We Are Now Prepared to Supply Your Wants for 1907 in .

Radiators, Hoods, Fenders, Metal Dashes, Etc.

FOR ANY STYLE OF CAR YOU DESIRE.



Long's Spiral Tube Radiators

are to be found on more high grade cars this year than ever before and the contracts we have for 1907 show we are pleasing all our old customers as well as winning many new ones. Long Radiators are simply unequalled for efficiency, lightness, strength, durability and the ease with which they can be repaired in case of accident.

We will be pleased to send you a catalogue and give you any information you desire.

LONG MANUFACTURING CO., Chicago, Ill.

LONG-TURNEY MFG. CO., Rome, New York.



TRANS-COMPOUND

A SEMI-SOLIDIFIED OIL

Trans-Compound is a fluid oil reduced to a heavy density. Forms a heavy friction reducing film over contact surfaces. Far more lasting in lubricating value than any grease.

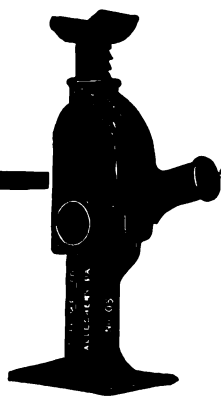
OTHER GRADES ARE:

EXCELLO GAS ENGINE CYLINDER OIL	- - -	light bodied
A. W. H. GAS ENGINE CYLINDER OIL	- - -	medium bodied
SUPER GAS ENGINE CYLINDER OIL	- - -	heavy bodied
S. H. STEAM CYLINDER OIL	- - -	for super-heated steam
TRANS-COMPOUND	- - -	semi-solid oil
HARRIS MOTOR GREASE (for compression cups)	- - -	medium and heavy
HARRIS GRAPHITE GREASE	- - -	for gears and chains

A. W. HARRIS OIL CO. 330 S. WATER ST.,
PROVIDENCE, R. I.

CHANDLER & LYON MOTOR SUPPLY CO. - Distributors for Harris Oils
San Francisco and Los Angeles

1-Ton Automobile Barrett Jacks



1-Ton Jack

for 1906 are single acting,
raising the car with down-
ward stroke of lever only.
Send for CATALOG 25,
showing in detail our

Popular Auto Jacks



ANNOUNCEMENT



We will treat any make wet storage battery sent to us prepaid, with our solid sulphuric acid (electrolyte) at 50 cents per cell, medium size. Your battery will then be a dry storage battery and not a spilling, unclean and unhandy apparatus.

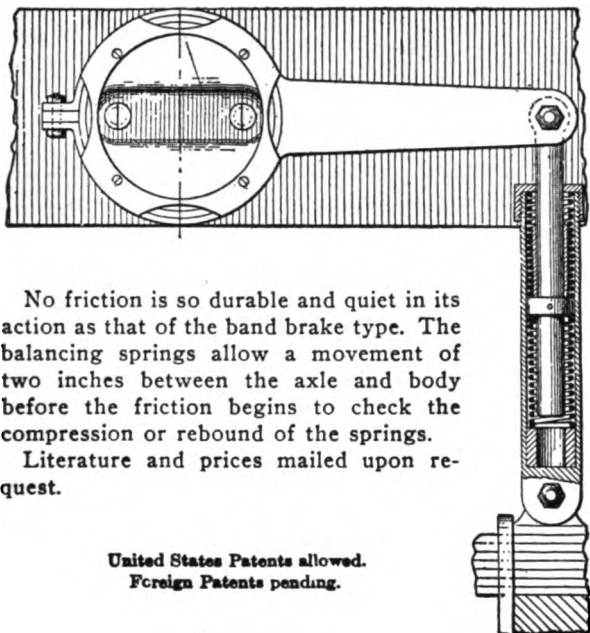
The dry storage battery can of course be recharged the same as a wet one.

THE ROYAL BATTERY CO., Makers
148 Chambers St., New York City

NATIONAL SALES CORPORATION
Factory Sales Managers, 296 Broadway, N. Y.

A PERFECT SHOCK ABSORBER

should check in both directions when the shock is severe enough to make riding unpleasant; but it should not act on the springs under ordinary conditions, as it tends to "deadens" the easy, flexible riding qualities of the springs.

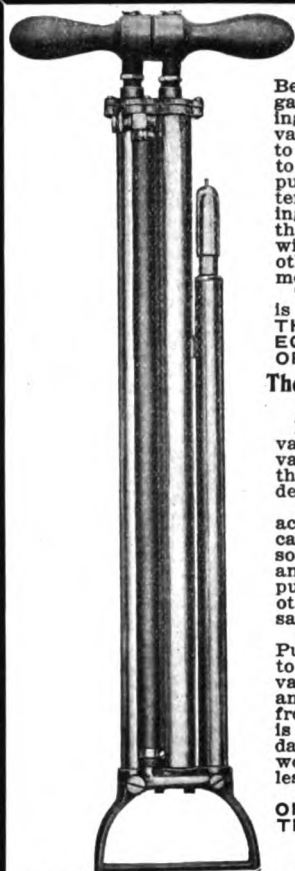


No friction is so durable and quiet in its action as that of the band brake type. The balancing springs allow a movement of two inches between the axle and body before the friction begins to check the compression or rebound of the springs.

Literature and prices mailed upon request.

United States Patents allowed.
Foreign Patents pending.

VESTAL SHOCK ABSORBER COMPANY
8817 Baum Street, East End . . . PITTSBURG, PA.



80% OF ALL AUTOMOBILE TIRES Are Not Correctly Inflated

Because with the ordinary pump and gauge the extreme pressure of air going through the small aperture of the valve in the tire causes the indicator to jump and tremble, and the pointer to vibrate with each stroke of the pump. Consequently the gauge registers inaccurately, and you are unknowingly pumping LESS AIR into one tire than into another. Naturally the rim will press into this tire more than the others, and eventually cut it, which means a new tire.

The only way to inflate your tires is to INFLATE EACH ONE WITH THE SAME AMOUNT OF AIR, thus EQUALLY DIVIDING THE WEIGHT OF YOUR CAR.

The BELL Pressure Indicating Pump Is the Only Pump that will do this.

It works on the principle of the pop valve on a boiler. Simply set this valve for the pressure desired, then the pop valve "blows off" when the desired pressure is reached.

Simple, isn't it? Yet unfailingly accurate. Every Bell Pressure Indicating Pump is guaranteed to be absolutely accurate and to stay accurate, and it is simply impossible for you to pump more air into one tire than another while the valve is set at the same mark.

In the BELL Pressure Indicating Pump, by a simple device, we are able to hold open the check in the tire valve, and still prevent back pressure amounting to 40 lbs. or more. Aside from the Perfect Indicator, the BELL is the finest compound pump sold today. It is made of brass throughout, works smoothly and easily. Takes up less room than the ordinary pump.

IT WILL SAVE YOU THE COST OF MORE THAN ONE TIRE DURING THE SEASON.

Price, \$6.00 Each
Manufactured by

DILLWYN M. BELL, Franklin and Michigan Sts., CHICAGO, ILL.
Franco-American Auto Supply Co., Distributors, 1404 Michigan Av., Chicago

THE FOSTER SHOCK BRAKE

is the best and most perfect device yet invented for eliminating shocks to your automobile occasioned by riding over rough places.



It takes away all the jar, prevents breakage and adds to the life of the machine.

Most dealers carry them in stock. All dealers should.

WRITE FOR PARTICULARS.

Gabriel Horn Mfg. Co.
974 Hamilton St. Cleveland, O.

The Lea "Speedistimeter"

is speed recorder, total- and trip-odometer, 8-day Chelsea auto clock—all in one.

Tells speed, distance and time of day

Fitted in waterproof brass case and connects with wheel by flexible shaft which passes through floor of car.



Guaranteed Accurate!

Write for booklet A, the handsomest and most complete instrument catalogue ever published. Proposition to agents.

William S. Jones 112 North Broad St.
Philadelphia

Sole Selling Agent for Motor Car Specialty Co.

Rough Roads Made Easy Riding

if your car is equipped with the

HOTCHKIN Anti-Jolt Device

Don't "Bump the Bumps" when this simple attachment permits of easy, comfortable riding on roughest roads

The device is hydraulic, and works in one direction only — on the recoil. The natural compression of the springs is not checked, but the recoil is effectually checked, thus making the tonneau a place of comfort instead of a torture-chamber.

It prevents jolting, broken springs, and injury to the spines of the passengers by reducing the vibrations. It secures better traction, higher speed, greater life of tires, stronger nerves, and a better temper for the motorist. Adjustable to all cars. Cost is very moderate, and one trip pays it. For full information, prices, etc., address:

P. M. HOTCHKIN

4017 LAKE AVENUE

CHICAGO

This illustration shows view along axle toward wheel from inside of machine



18,500 HOLLEY CARBURETERS HAVE BEEN SOLD IN SEVENTEEN MONTHS

Cut shows new Model "L" Carbureter, which we furnish in sizes from 3-4 inch to 1 1-2 inch. We supply this carbureter with a special connection to fit any two-cylinder Rambler. Price, including connection, \$13.00.

Special Model "A" Carbureter for 1901, '02 and '03 Oldsmobile	\$12.00
" " " " " " 1904 Oldsmobile	12.00
" " " " " " Oldsmobile Touring Runabout and "T" Car	11.50
" " " " " " Northern Runabout	12.00
" " " " " " 1905 Winton Models "B" and "C"	18.00
" " " " " " Two - cylinder Autocar Runabout	14.00



HOLLEY BROTHERS COMPANY, 664 Beaubien St., Detroit, Mich.

New England—The Post & Lester Co., Hartford, Conn. Philadelphia Agent—W. W. Taxis, 506 Odd Fellow Temple
Pacific Coast Agents—The Geo. P. Moore Co., San Francisco and Los Angeles, Cal.

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Washington, D. C.—National Electric Supply Co., 1330 New York Ave.
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Buffalo—F. A. Cramer, 737 Main St.
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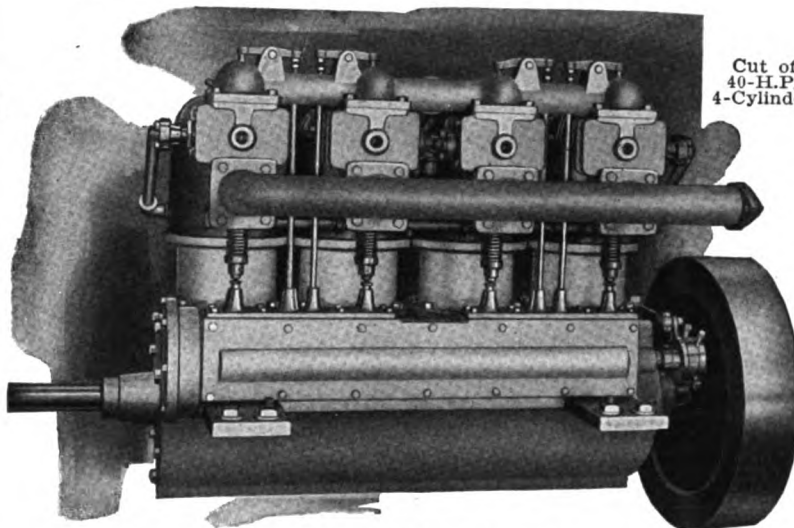
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THE
"PERFECT"
KEROSENE MOTOR
 SMOKELESS AND ODORLESS
 10 to 60 H.P.

The Only Engine of its kind ever produced for Auto-Work

Absolutely
 under control
 at all times

Smokeless,
 Odorless,
 Consuming
 all its own
 gases and
 operated by
 Kerosene
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Cut of
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Vertical
 and double
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 engine
 10 to 60 h.p.

Any size
 and design
 to order

Get full
 facts about
 it or TRY
 THEM

WE ALSO MANUFACTURE THE
"PERFECT" SLIDING GEAR TRANSMISSION

Operated by an internal-keyed shaft. Three speeds forward, one reverse. Direct
 drive on high gear. Strongest transmission on the
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Manufactured by
ST. ANNE
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CORK INSERTS

The "COMPO" Clutch and Brake

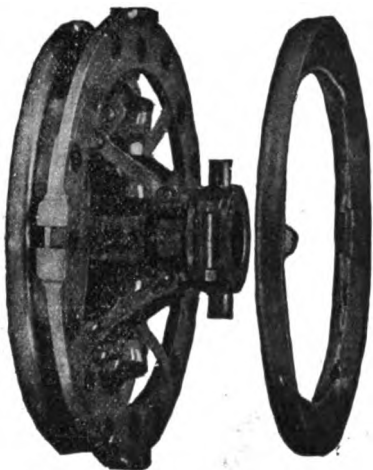
Patented

(WITH CORK INSERTS)

Patented

 We license manufacturers to make "Compo" or composite clutches by equipping THEIR TYPE OF CLUTCH with Cork Inserts, and WANT YOU to try ONE clutch equipped under our direction.

ON APPLICATION WE WILL GIVE YOU THE REASONS



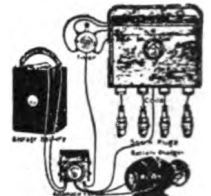
- WHY Cork Inserts should be used in all types of CONE CLUTCHES in place of leather.
- WHY Cork Inserts should be used in alternate disks in metal to metal clutches, or in place of leather-faced disk clutches.
- WHY EXPANDING AND CONTRACTING MEMBERS of brakes, or the drums of transmission brakes, should be equipped with CORK INSERTS.
- WHY THE PECULIAR AND GREAT FRICTIONAL QUALITY OF CORK is neither diminished nor affected by wear, dust, moisture, atmospheric conditions, water, oil, or other lubricants.
- WHY THE REPORTS OF TESTS made at the Worcester Polytechnic Institute, Purdue University, and Lawrence Scientific School of Harvard University showing the remarkable results obtained by the use of CORK INSERTS should interest you.
- WHY THE AUTOCAR COMPANY of Ardmore, Pa. (licensee), inserted Cork Inserts in its type of disk clutch (as herein illustrated) in more than two thousand cars during 1904 and 1905.
- WHY THE AUTOCAR COMPANY will use Cork Inserts in about fifteen hundred automobile clutches during 1906.
- WHY THOUSANDS OF CORKS are in use in loom clutches, and why Cork Insert clutches are rapidly displacing the leather-faced clutches.
- WHY THE CROMPTON & KNOWLES LOOM WORKS, of Worcester, Mass. (licensee), is shipping more than one hundred looms so equipped, per month.
- WHY THE CROMPTON-THAYER LOOM COMPANY, of Worcester, Mass. (licensee), has adopted the "Compo" Cork Insert clutch for practically its entire output.
- WHY THE WOOD WORSTED COMPANY has ordered 600 looms and will soon order 600 more looms fitted with Cork Insert clutches for the new mill now being erected at Lawrence, Mass.
- WHY MORE THAN ONE MILLION CORKS have been used in electric street railway brake shoes in Boston and vicinity. Licensees, J. B. & J. M. Cornell Company, New York, N. Y., and the Gibby Foundry Company, East Boston, Mass.

For particulars apply to

National Brake & Clutch Company

16 STATE ST. - BOSTON, MASS.

"Floating the Battery on the Line," a term which means charging a battery while the battery is giving off current, is the principle on which the Apple Ignition System works.



APPLE IGNITION SYSTEM

The Apple Battery Charger is for charging a storage battery right aboard your car. It has an adjustment for charging at the same rate at which the battery current is being used for igniting your engine.

"Floating the battery on the line" greatly increases the efficiency of a storage battery.

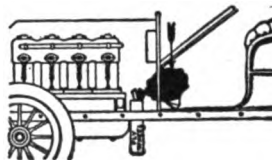
It provides a strong, always ready, everlasting current of absolute evenness, which is vitally essential to operate a jump spark coil vibrator perfectly.

It provides two reliable sources of current right aboard your car, preventing your car's being "put out of business" miles from home on account of an exhausted current supply.

A lighter battery than usual can be employed when the battery is "Floated on the line."

Sulphating of the battery's plates is eliminated because of no "excessive discharging," and the battery's life is lengthened.

Moreover, removing the battery from the car for charging is rendered unnecessary, and the expense of charging, which would otherwise be incurred, is saved.



ONE OF MANY APPLICATIONS

The Apple Battery Charger is a governed dynamo which is turned by the engine fly-wheel, and it is designed and built as well as any dynamo in the world, irrespective of size or use for which intended.

It is entirely inclosed, dirt, dust, water and oil proof.

The Apple Battery Charger can be used in any position and can be installed on any automobile.

Write today for full information, stating whether your engine is make and break or jump spark.

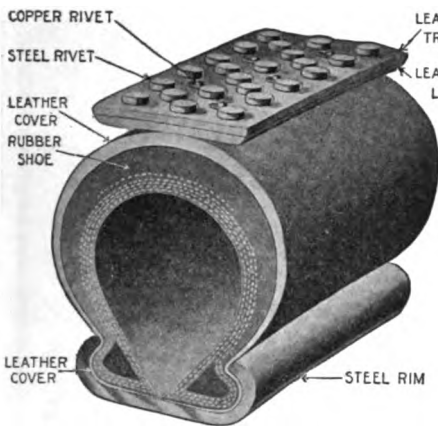
The Dayton Electrical Mfg. Co.,

90 St. Clair Street,

Dayton, Ohio



We can make practically a new tire of your old one if there is anything left of it to work on.



SECTION OF CLINCHER TIRE LEATHERIZED

A tire so treated has many of the good points of the

Healy Leather Tire

which we make, and will be free from puncture, skidding and rim-cutting.

IT WILL PAY YOU TO STUDY THIS CUT

These tires are built with "the best of everything in the best place," and every contingency of strength, reliability and safety has been met by this construction.

Write for Particulars in detail

HEALY LEATHER TIRE COMPANY

Healy Building 88-90 Gold Street NEW YORK CITY

ADWEAR

TIRE SLEEVE

First to the rescue when the tire is disabled from puncture, rim-cut, blow-out or bulge.

In less than a minute the sleeve is in place and the injury repaired reliably and permanently.

Tire accidents will happen, but the Adwear saves loss of time, temper, inconvenience, discomfort and expense.

In emergencies an Adwear Tire Sleeve is worth more than, and costs but a fraction as much as, a new shoe.

Adwear is made of heavy waterproof chrome leather; broad steel burrs with self-tightening steel rivets that never wear out; patent double clutch hooks that cannot pull loose; stoutest chrome leather laces.

Adwear Prices: Style "A," \$2.00 each; set of four, \$8.00. Style "AA," double tread, \$2.50 each; set of four, \$9.00. Style "AAA," extra wide double tread, \$3.00 each; set of four, \$11.00.

Sent on approval. Write for free Booklet C. Address

ADWEAR
North Attleboro, Mass.

"BEST THING ON WHEELS"

THE MOSS PHOTO ENGRAVING CO.

PUCK BUILDING NEW YORK
ELM ST. COR HOUSTON.
TELEPHONE 81 SPRING
ESTABLISHED 1871.

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EXPERIENCE HAS TAUGHT US HOW TO MAKE AUTOMOBILE CUTS

Write us in relation to half-tones, zinc etchings, wash drawings, electrotyping or any other work you may want.

Work intrusted to us will not only be done well, it will be done quickly and reasonably.

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CAPE TOPS
SEAT COVERS

TIRE CASES
GLASS FRONTS

\$6

Fabric
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Enameled
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TRUNKS CELLULOID FRONTS
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NEW CATALOGUE?

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H EAVEY Cars, Light Cars, Racing Cars or
Touring Cars are but half equipped if
 not furnished with MICHELIN TIRES, and are
 not giving the best service they are capable of.

Put them on your car and you will learn
 what a "*Michelin Mile*" means.

MICHELIN PRODUCTS SELLING COMPANY

Write for facts and figures of
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Telephone { 5560 Madison Square
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Exclusive American Representative of Michelin & Cie., Clermont-Ferrand, France

===== E. D. WINANS, General Manager =====
 31-33 WEST 31st STREET, NEW YORK CITY

Troubleless Trips Cannot Be Made on Troublesome Tires

Many a 'cross-country trip has been marred by inexcusable tire behavior.

If tires are to play their part in the luxury of automobiling they must be fully prepared to do battle with roads that are decidedly tough.

Nobody can foresee or forestall accidents, but wholly unnecessary disorders have been foreseen and forestalled (and we can prove it) in the making of

MORGAN & WRIGHT TIRES



Rims branded in the channel with this copyrighted mark have been inspected and pronounced perfect. We guarantee our tires only on rims so branded.

CLINCHER ——— DUNLOP ——— BAILEY "WON'T SLIP" TREAD

MORGAN & WRIGHT, CHICAGO

New York
 Syracuse

Philadelphia
 Boston

Cleveland
 Dayton

Minneapolis
 Detroit

St. Louis
 Atlanta

Denver
 Los Angeles

San Francisco
 Portland

The Goodyear

DETACHABLE

AUTO-TIRE

ON

Universal Rim

can be ridden deflated for miles over country roads or rough pavements without material injury, for it

This is a section (in part) of a Goodyear Detachable Auto Tire, as it would look when ridden deflated. Notice the big rounding surface of the Rim—nothing to cut the casing.

The Goodyear Detachable Auto Tire will not creep when ridden deflated.

Rim or Flange

CAN'T RIM-CUT

The illustration plainly shows why. Call at any of the following stores and learn the dozens of other trouble and time-saving features

Boston, 261 Dartmouth St.
New York, cor. Sixty-fourth
St. and Broadway.

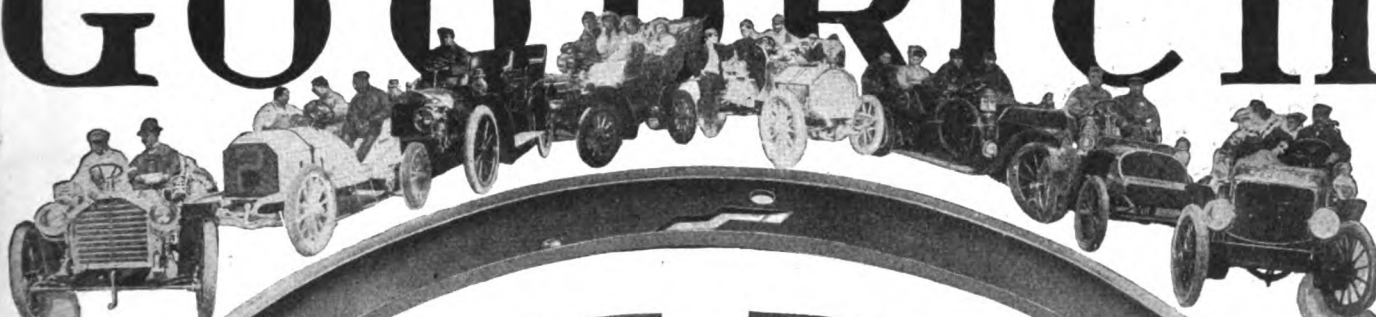
Chicago, 82-84 Michigan Ave.
Cincinnati, 242 E. Fifth St.
St. Louis, 712-714 Morgan St.

Los Angeles, 932 So. Main St.
Oakland, Geo. P. Moore & Co.,
377 10th St.

Buffalo, 719 Main St.
Denver, 220 Sixteenth St.
Detroit, 242 Jefferson Ave.

The Goodyear Tire and Rubber Co., Freedom Street, Akron, O.

GOODRICH



Tire Enthusiasm

It's abroad in the land and catching when you come in contact with Goodrich Quick Detachable Tire users. Enthusiasm is a habit with us and has helped to find ways for doing things bigger and better than ever before. A power for good, and mightily in evidence when you use Goodrich Tires.

The B. F. GOODRICH COMPANY - Akron, Ohio

NEW YORK,
66-68 Reade St., and 1625
Broadway.

CHICAGO,
24 E. Lake St.

BOSTON,
161 Columbus Ave.

BUFFALO, 731 Main St.
DENVER,
1444 Curtis St.
CLEVELAND,
2188 Ninth St., S. E.
OAKLAND, CAL.
Fourth Ave and Washington
Street.

PHILADELPHIA,
909 Arch St.
DETROIT,
80 E. Congress St.
ST. LOUIS,
3926-28 Olive St.
LONDON, E. C.
7 Snow Hill.



Rims branded in the channel with this copyrighted mark have been inspected and pronounced perfect. We guarantee our tires only on rims so branded.

QUALITY -- begets -- SERVICE!

YOU WANT
YOU MUST HAVE { GOOD TIRES
WE MAKE

HARTFORD { DUNLOP
CLINCHER
UNIVERSAL RIM

THE HARTFORD RUBBER WORKS CO.
HARTFORD, CONN.



New York
Boston
Philadelphia
Buffalo

Cleveland
Chicago

Detroit
Denver
San Francisco
Los Angeles



The Best will continue to be the only automobile tires worth considering

Diamond Wrapped Tread Construction

Will continue to be the best product that experience, high-grade rubber and fabric, and skilled workmen have combined to produce.

Automobilists of experience haven't forgotten the demand for cheap tires that caused them so much trouble three years ago. They're riding *Quality Tires* now, and nothing can change them.

Only the inexperienced are in danger of being led into error. And they can save themselves much trouble by consulting experienced tire users about the tire situation before they specify tire equipment.

It's quality that counts.

Our fine new catalogue contains much that is interesting and will help all tire users. Yours for the asking.

THE DIAMOND RUBBER CO., AKRON, OHIO



Rims branded in the channel with this copyrighted mark have been inspected and pronounced perfect. We guarantee our tires only on rims so branded.

NEW YORK, 78 Reade Street
NEW YORK, 1717 Broadway
BOSTON, 174 Columbus Avenue
PHILADELPHIA, 304, 306 N. Broad Street
BUFFALO, 715 Main Street
DETROIT, 258 Jefferson Avenue

BRANCHES

CLEVELAND, 1514 Euclid Avenue
CHICAGO, 1523-31 Michigan Avenue
ST. LOUIS, 306 Olive Street
MINNEAPOLIS, 503 Second Ave. South
DENVER, 1735 Arapahoe Street
SAN FRANCISCO



CONE



CONE WITH ROLLERS



CUP

TIMKEN ROLLER BEARINGS

POINTS OF MERIT No. 2

REGARDING DURABILITY—As there is a rolling instead of a friction motion and all parts are case hardened, the wear is reduced to a minimum. By using a perfect dust-proof device, the oil is retained and all dust, dirt and foreign matter excluded. This, together with a tapered construction which permits of **taking up of any wear**, insures long life to TIMKEN BEARINGS, which are fully guaranteed for two years.

Fifty per cent. reduction of draft
Oiling once a month
Simple and durable
Guaranteed for two years
in use all over the world

Illustrated catalog of front and rear automobile axles and parts, mailed on application.

Timken Roller Bearing Axle Co.
CANTON, OHIO.

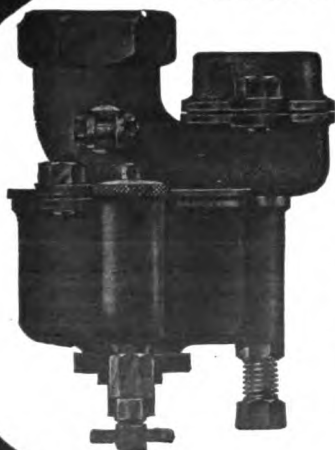
NEW YORK: 219 W. 46th St.

CHICAGO: 339 Wabash Ave.

KINGSTON CARBURETERS

MOST EFFICIENT
MOST SATISFACTORY

Four Different Types
Four Different Principles



This Carburetor has a Central Float Chamber in which is fitted a hollow Float which is seamless; through levers this operates a weighted float-valve placed on one side of float-chamber. The spray nozzle is located in center of float-chamber and is adjustable by needle-screw. The normal air opening is also through the center of float-chamber, which opening is adjustable and so arranged as to form a positive starting device. An auxiliary air-valve is also provided with an adjustable spring tension. The valve is of metal, is light and rests on a leather seat and is fitted with a flanged vertical inlet for drawing warm air.

Type K C Carburetor is fitted with a piston-throttle of the balanced type, is noiseless and perfectly automatic. Either vertical or horizontal outlet opening will fit any motor in any place. This is, we believe, the finest made carburetor on the market. A trial will convince you. **IT MUST BE SEEN TO BE APPRECIATED.**

There are over 34,000 Kingston Carburetors in use, of the various types, which proves their merits, and that they are no experiment.

Sold by Leading Dealers and Jobbers throughout the United States

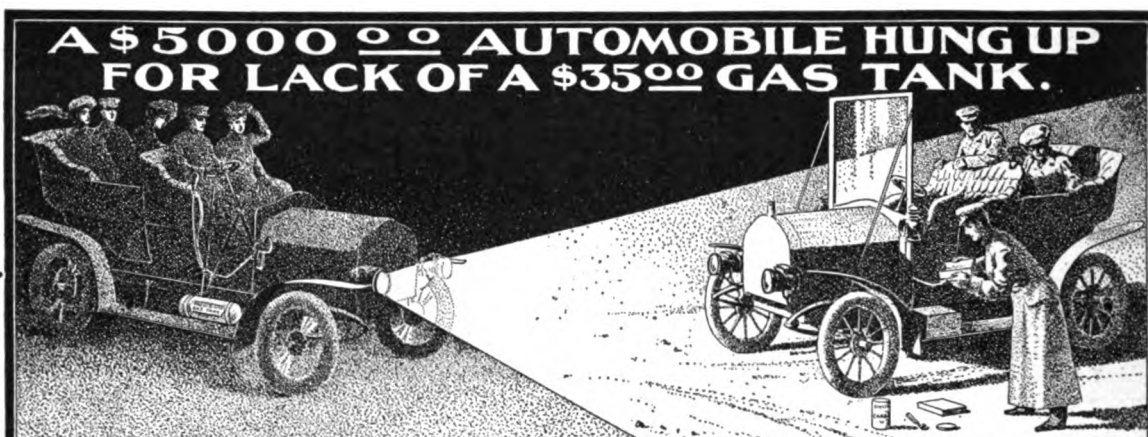
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MANUFACTURED BY

BYRNE, KINGSTON & CO., KOKOMO, IND., U.S.A.

Pacific Coast Branch, Hughson & Merton, 105 Front Street, San Francisco

Canada, John Miller & Sons, Toronto and Montreal



Ever see anything like what's happening to the man on the right, Mr. Motorist?

And, when a man pays from \$1,000.00 to \$5,000.00 for a Motor Car, with an engine worth a fifth of the whole cost, body worth a tenth, wheels a twentieth and so on—all equally necessary to giving him the pleasure he expects to get for his money—isn't it just a little inconsistent to economize (?) on light, which costs but 1 per cent. of the total outlay, and at a risk of 50 per cent. of all the pleasure?

For the best light apparatus costs only about a hundredth part as much as the rest of the car, and on it depends just about one-half of all the enjoyment you can expect to get. Any Motorist will tell you that there is nothing to compare with the exhilaration of a speedy night ride.

But you cannot really enjoy it unless you have confidence and are without thought of danger. Clear light on the road is your protection against accident. With it, you are sure—

confident. Without it, fear handles your steering wheel.

And the one and only way to be sure of good, clear, dependable light, always, is to get your gas ready made and ready to use.

Send for our Prest-O-Lite book "Ready Made Gas for Auto Lights" and read how you can really economize on light and, at the same time, be rid of jiggling carbide forever. There are over 11,000 Prest-O-Lite tanks in use today and over 400 Recharging Stations in the United States. You can exchange empty tanks for full ones at any of the stations by paying the cost of recharging, and the change can be made in five minutes.

We want every Motorist to have a copy of our Prest-O-Lite book. Let us send you the book with our compliments and write you a personal letter about the light.

THE PREST-O-LITE CO.

Department 112

INDIANAPOLIS, IND.



Absolutely Accurate— Reads from the *Seat*

An accurate speed and distance indicator is quite as necessary on your AUTOMOBILE as a watch is in your POCKET.

Furthermore, it must be ABSOLUTELY DEPENDABLE under all conditions of heat, cold or position. Otherwise a speed indicator is not worth the space it occupies. Isn't that so? You can always depend on

The Warner Auto-Meter

whether you go slow or fast, whether the road is rough or smooth, hilly or flat.

It's the only indicator which is ALWAYS absolutely infallible at SPEEDS UNDER TEN MILES PER HOUR, and any other speed.

It's the only indicator which gives correct readings in ANY POSITION, no matter what the angle of your car.

The Auto-Meter is the only indicator you can READ with certainty, because the dial changes with the SPEED ALONE, and is uninfluenced by the jar of the car.

The Warner Auto-Meter has all these EXCLUSIVE good points—because it is the ONLY speed indicator which is actuated by the same FIXED, UNCHANGEABLE MAGNETISM which makes the Mariner's Compass reliable and dependable FOREVER under all conditions.

No one else can successfully use magnetism to determine the speed of an automobile, though it's the only POSITIVE and SURE way, because there is only just ONE WAY that magnetism can successfully be used for this purpose, and WE HAVE PATENTED THAT WAY.

The Warner Auto-Meter will last a life-time. It's as sensitive as a compass and as SOLID AS A ROCK. It will withstand any shock that your CAR will stand without the SLIGHTEST INJURY and without affecting its ACCURACY in the slightest degree.

We will gladly tell you more about this wonderful instrument if you will write us, and at the same time will send you something every motorist will prize—our

Free Book, "Auto Pointers."

Write for particulars TODAY—don't put it off.

THE WARNER INSTRUMENT CO., 252 Roosevelt Street, BELOIT, WIS.

(The Auto-Meter is on sale by all first-class dealers and at most Garages.)

THE RELIABLE "DAYTON"

Built for City and Country. Will travel any road with its 22 inch road clearance. Any speed up to 25 miles per hour. Two-cylinder double-acting motor, 10-12 H.P. No valves, gears, cams, springs or camshaft. So simple anyone can run it and keep it running. Price Complete, with Top, Side Curtains, Storm Front, Lamps and Fine Tool Equipment, \$500.00. Address Dept. "C" for full particulars.

Dayton & Mashey Automobile Works, "Dept. C" 4515-4517 Evans Ave., CHICAGO, ILL.

The CLIMAX Commercial Car

CONVERTIBLE
LIGHT DELIVERY

Capacity, 1,000 pounds
3-inch Solid Tires

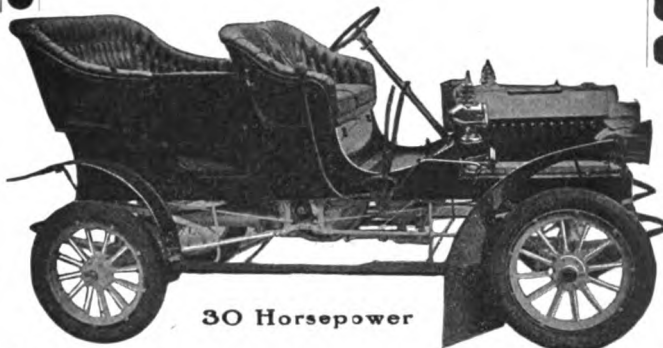
Simple, Light
and Durable

Fills a long-felt want

With Top, \$900.00
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HINDE & DAUCH

Sandusky, Ohio

Logan

30 Horsepower

Silent and Easy Riding

Made of the best design, of the best materials, and with the best workmanship throughout, this car is the ideal size and type for the average motorist. Combines the best qualities of both large and small cars in speed, power, easy operation, etc.

Write for catalogue. Address Dept. "B"

The Logan Construction Company, Chillicothe, O.

Agents in principal cities. Good agents wanted in all towns.

"That Car of Quality"



**ENGLISH
DAIMLER
COMPANY**



Exclusive Agents for United States and Mexico of
Daimler Motor Co., Ltd., Coventry, Eng.

IN STOCK: 28-36 and 40-H.P. Limousines
28-36-H.P. Touring Cars, 40-H.P. Chassis

SALESROOMS:

1743 Broadway, Southwest Corner of 56th Street.

English Daimlers are Sold Under Selden Patent.

THE MARMON

"A Mechanical Masterpiece"



Model C, 24 H.P., \$2,500
Model D, 30 H.P., \$3,000
4-Cyl. Air Cooled

Double Three Point
Suspension
No Cardan Joints
One Finger Control.

The Marmon kind of Air Cooling is dependable in all climates and under all conditions and is so guaranteed by this house. The Marmon Motor never overheats, partly due to the arrangement of the cylinders, and partly due to our oiling system, the simplest, most efficient, and most economical oiling system ever devised. Write for Catalog No. 2. Agents wanted in unoccupied territory. Get in line for 1907.

NORDYKE & MARMON CO. (Estab. 1851) Indianapolis, Ind.

Automobile Dust Guards

You can eliminate the dust evil of automobiling by attaching to your car a set of BROWN AUTOMOBILE DUST GUARDS.

In one season you will save three times their cost in saving of wearing apparel. PROTECT YOUR FRIENDS.

BROWN DUST GUARDS are vanes extending around the back of the car body. They do not disfigure the car, but improve its beauty.

They are guaranteed to keep all dust from the rear off those riding in the car, and will be shipped to you for trial before purchasing. We manufacture these guards to order to fit any make of machine.

Agents wanted. Write for particulars.

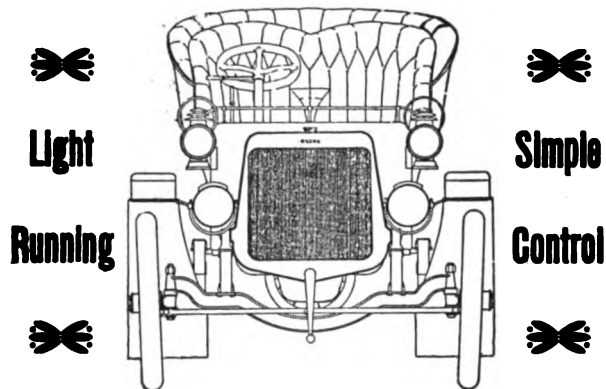
W. H. BROWN,

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CLEVELAND

G. H. Deere, Pres. W. E. Clark, Vice-Pres. C. F. Duery, Mgr.

DEERE



Light
Running

Simple
Control

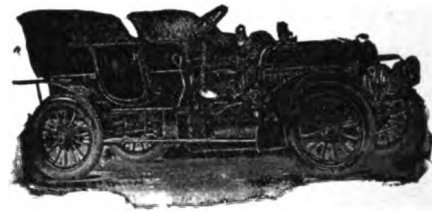
19 TYPE "A" 06

For a car of quality, style and one that embodies many pleasing features not found in other cars of the same price, select a "DEERE."

Price \$2,000.00

Deere-Clark Motor Car Co.
MOLINE, ILL.

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Why Is the Royal Tourist Famous?

ASK AN OWNER.

ROYAL

Model G. \$3,500. 40 H.P.

THE ROYAL MOTOR CAR CO.

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AGENTS: C. A. Duerr & Co., New York; G. J. Dunham, Boston; The McDuffee Automobile Co., Chicago; G. W. Caplin, Minneapolis; Automobile & Supply Co., Ltd., Toronto Motor Shop, Philadelphia; Rayburn Motor Car Co., St. Louis; Standard Automobile Co., Pittsburgh; Amos-Pierce Auto Co., Syracuse; Schoeffel Co., Rochester; Royal Motor Car Agency, San Francisco.
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MITCHELL



The Satisfactory
Motor Delivery
Wagon—"Built
for Business"

It does the work and does it well. It is specially designed and built to go and keep going. Every part is strong—the greatest strength being put where it is most needed to withstand shocks, strains and weight. You have no annoying breakages with the MITCHELL. Tests will prove it. Capacity, ONE TON.

SPECIFICATIONS.

Motor—12-14 H.P., 9-cylinder vertical. Transmission—Slide gear, three forward, one reverse speed, driving direct on high speed with no gears in mesh. Wheel base—100 inches. Tread—56 inches. Wheels—30-inch artillery. Tires—3-inch solid. Steering Gear—Irrversible. Control—Spark and throttle. Lubrication—Mechanical. Carburetor—Float feed. Radiator with fan. Springs—50-inch half elliptical front and rear. Speed—15 miles per hour. Equipment—Side lamps and complete set of tools. Brakes—Foot and hand emergency. Capacity—1 ton.

PRICE COMPLETE, \$1,400.00

Mitchell Motor Car Co., Racine, Wisconsin
New York Agents—MITCHELL COMMERCIAL VEHICLE CO., 121 W. 31st St.

THE GALE



\$800.

**THE SINGLE CYLINDER RUNABOUT QUESTION
WHY**

Has the public always looked favorably on the single cylinder runabout?

BECAUSE

First: It takes an experienced mechanic to keep a multiple cylinder machine in running order.

Second: The average business man has little time to study into the complications of a multiple cylinder machine.

Third: Every cylinder means an extra spark plug, extra valves, extra coil and extra weight on tires; therefore extra troubles.

Fourth: A single cylinder runabout will carry you thirty miles an hour, and that's fast enough for any sane person.

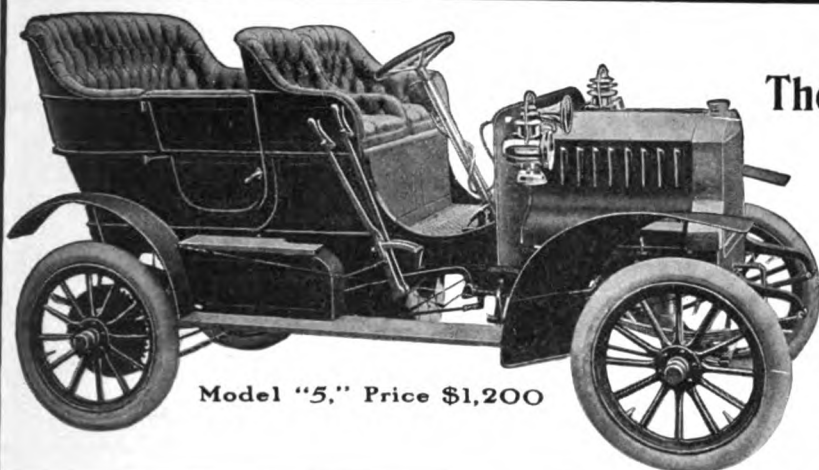
Fifth: This light machine will ascend any hill that your horse and carriage will ascend, and what more does a person want?

NOW

From the above statements, you may imagine that we make nothing but single cylinder machines.

This is not so. We also manufacture multiple cylinder runabouts and touring cars; and we would be glad to send you an illustrated catalogue describing them. We put up the single cylinder talk because we are in business to please the public, and simplicity is the cry from the purchaser.

THE WESTERN TOOL WORKS, 110-112 Kellogg St., Galesburg, Ill., U. S. A.



Model "5," Price \$1,200

The LAMBERT

A Car With No Fixed Speed

Any speed you desire

A GEARLESS FRICTION DRIVE CAR

"Sold on a guarantee"

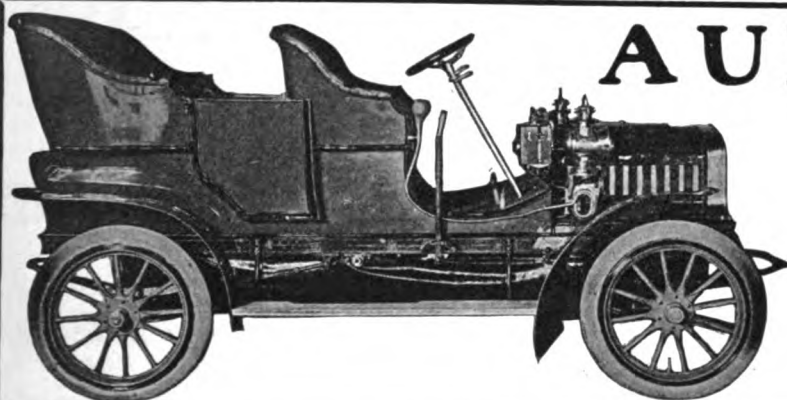
So many superior features we can't describe them in this limited space.

Write Us for Catalog.

Lambert Pleasure Cars and Commercial Trucks range in price from \$900 to \$3,000. Dealer Agents wanted where we are not represented.

NEW YORK AGENTS.—The McLean Automobile Co.,
242 West 41st Street, New York

THE BUCKEYE MANUFACTURING COMPANY, Anderson, Indiana, U. S. A.
Members American Motor Car Manufacturers' Association



AUBURN Model C

THE best automobile made to-day is no better than the Auburn, will not run any longer, nor give any better satisfaction, has no better equipment, has no better style. This car has from 20 to 24 H.P., speed from 3 to 40 miles an hour, 94-inch wheelbase, 30x3½-inch tires.

Write us for agency and terms at once.

Auburn Automobile Co.
AUBURN, IND.

THE HOLSMAN AUTOMOBILE

Four Years of Success. Built high enough to travel the country roads like a carriage. Clears the center of the road by eighteen inches, and therefore has **twice the advantage** of the ordinary machine in muddy, rutty, rough or rocky roads. Has large wheels, solid rubber tires, and **rides like a carriage**. The Holsman exclusive patent marks an era in automobile building. It **does away with all live axles, friction clutches, differential gears, pumps, etc.** Reverses without extra gears. **No water to freeze; no puncture troubles; no odor.** New hill-climbing power.



Ask for Catalogue A. B.

The Holsman Automobile Company,
Monadnock Block, CHICAGO.



Four Cylinder Water Cooled
Price, \$2,500

DORRIS CAR

30 H.P. ACTUAL

FAST AND POWERFUL

SLIDING GEAR
TRANSMISSION

VALVES in CYLINDER HEADS

Dorris Motor Car Co.

1215 N. Vandeventer Ave., St. Louis.

Columbia

STILL WINNING!

At the meet of the Washington, D. C., Automobile Association, Saturday, June 16th, **MARK XLVII, 40-45 H.P.**, fully equipped, driven by C. J. Hurst, won first prize in the five mile \$4,500 class race, and second prize in the five mile free-for-all race, beating five other cars of prominence.

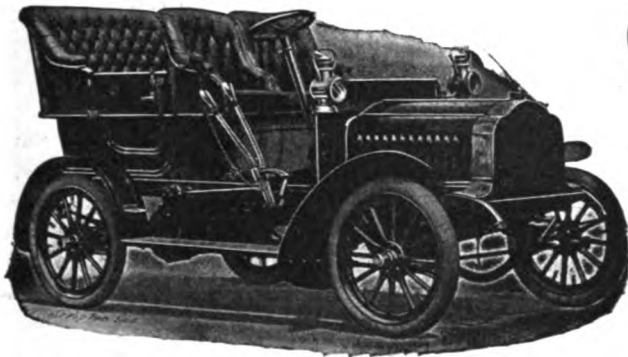
MARK XLVI, 24-28 H.P., fully equipped, driven by E. C. Bald, won first prize in the five mile \$3,000 class race.

MARK XLVII, 40-45 H.P., \$4,500 to \$5,500. MARK XLVI, 24-28 H.P., \$3,000

Separate catalogues of Columbia Gasoline Cars, Electric Carriages, and Electric Commercial Vehicles on request.

ELECTRIC VEHICLE COMPANY, Hartford, Conn.

New York Branch: 134-136-138 West 39th St. Chicago Branch: 1332-1334 Michigan Ave. Boston: Columbia Motor Vehicle Company, Trinity Place and Stanhope St. Philadelphia: Pennsylvania Electric Vehicle Company, 250 North Broad St. Washington: Washington E. V. Transportation Company, 15th St. and Ohio Ave. Member Association Licensed Automobile Manufacturers.



16-H.P. LIGHT TOURING CAR, \$1,400.

Compound MOTOR CARS

MECHANICALLY CORRECT in every DETAIL. Manufactured in one of the largest and finest equipped automobile plants in this country. **PROMPT DELIVERIES** of all models **GUARANTEED**. Catalogue sent upon request.

The E. H. V. CO., Middletown, CONN.

The BAKER SUBURBAN



THE BAKER SUBURBAN is the newest product of the Baker factory, manufacturing Electric Automobiles exclusively.

THE SUBURBAN is a gentleman's phaeton for two passengers and is designed especially for city use and country club service.

Its ample power and high speed make it an ideal vehicle for the uses mentioned.

It is solid and substantial and has sufficient weight to give it stamina and great enduring quality.

Finished and upholstered in the most superb manner it compares favorably with our other

"ARISTOCRATS OF MOTORDOM"

THE BAKER SUBURBAN has been the sensation of the season.

Write for catalogue describing it and our complete line of Imperials, Stanhopes, Victorias, Surreys, Depot Carriages and Broughams.

THE BAKER MOTOR VEHICLE CO.

20 Jessie Street

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CRAWFORD

24-28 Horsepower TOURING CAR

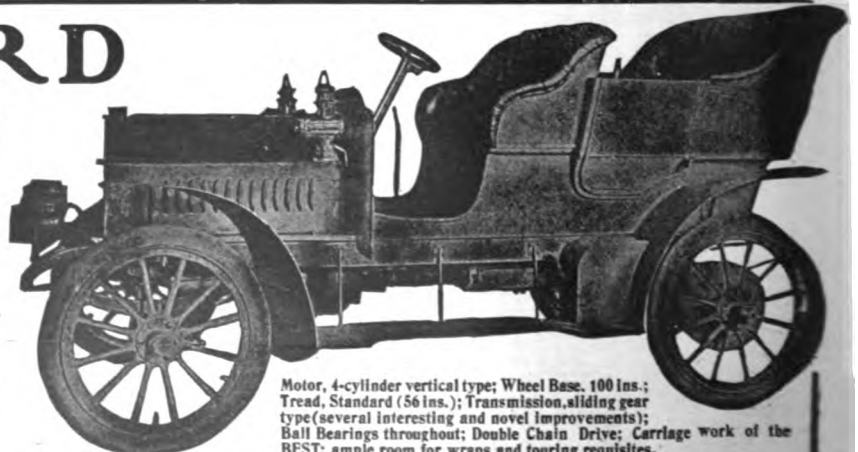
A 5-passenger touring car with ample power to drive it anywhere; workmanship of the best and mechanical details developed to an unusual degree; a good serviceable car at a moderate price, \$2,000.

Send for Detailed Description, Photographs, and additional information.

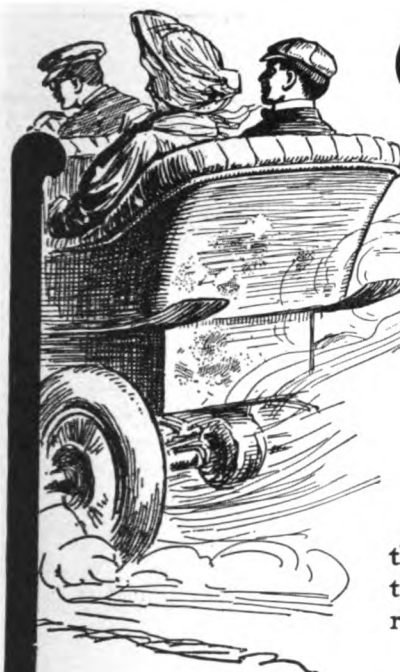
CRAWFORD AUTOMOBILE CO., Main Offices and Factory, **HAGERSTOWN, MD.**

New Amsterdam Motor Transportation Co., 152 West 56th Street, Sole Representatives for New York City and vicinity.

Boston Automobile Exchange, Boston, Mass.; North Philadelphia Automobile Station, Philadelphia, Pa.; C. P. Warner & Co., Chicago, Ill.; Woodward & Reopell, Springfield, Mass.; Chas. W. Buckley, Worcester, Mass.; Geo. W. Bender, Waynesboro, Pa.; Wm. H. Ennis, Cumberland, Md.



Motor, 4-cylinder vertical type; Wheel Base, 100 ins.; Tread, Standard (56 ins.); Transmission, sliding gear type (several interesting and novel improvements); Ball Bearings throughout; Double Chain Drive; Carriage work of the BEST; ample room for wraps and touring requisites.



Clean up with

the
wonderful
new cleanser

MOBO

During a long run, the mud and dirt is bound to dry and harden on the machine. If rubbed off—the surface is scratched beyond redemption. If simply washed off—ugly stains remain which are likewise unremovable outside of the paint shop.

The only way to thoroughly clean the car, and at the same time preserve the lustre of the highly polished surface, is by using Mobo. A pure vegetable oil product which quickly removes grease and dirt of any kind. Prevents blistering and cracking of the paint and varnish. Can be used on harness and leather goods—also woolen fabrics. So harmless that it will not injure the most delicate skin.

Put up in 2 lb. and 8 lb. cans; also in tubs, half barrels and barrels. If your supply house does not keep it, send us his name and address—we will see that you are supplied.

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PENN PETROLEUM CO.

AUTO OILS



MOTOR BOAT OILS

AGENTS WANTED

117 N. SECOND ST. · PHILADELPHIA · PA.

Absolute perfection of mechanical construction enabled the

Jones Speedometer

to win the

GOLD MEDAL

in the 2,000 mile English Reliability Test for Speed Indicating devices, held under the auspices of the British Automobile Club.

The Jones Speedometer scored the highest possible number of points. It was the only American manufactured instrument to score a perfect record. It was the only instrument in the contest to go through the severe test without adjustment.

The Jones Speedometer is the one practical Speed Indicating device in use to-day. The only instrument with a principle which permits of initial and permanent accuracy; the only instrument sufficiently durable to withstand the severe jolts and jars of the roughest roads; the only instrument with a dial which can be read accurately while traveling at high speed.

Jones Speedometer

Mfg. by Jos. W. Jones

126 West 32d St., New York



There is no motor car the equal of a
Single-Cylinder

CADILLAC

at the price of a

Single-Cylinder

CADILLAC

There is no motor car at any price that will give so much actual motor car value for every dollar invested as a

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There is no motor car at any price that is less expensive to maintain than a

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There is no motor car at any price that will climb any hill that cannot be climbed by a

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There is no motor car at any price that will travel any road that cannot be traveled by a

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There is no motor car at any price that so persistently "makes good" in spite of abuse as the

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CADILLAC

There is no motor car at any price which second hand will readily sell for so great a percentage of its original price as a

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CADILLAC

All points worth thinking about

Light Runabout, \$750.00

Light Touring Car, \$950.00

Cadillac Motor Car Co.

DETROIT, MICH.

Member Association Licensed Automobile Manufacturers



Every car is tested to 60 miles an hour

The 50 Horsepower THOMAS FLYER (\$3,500)

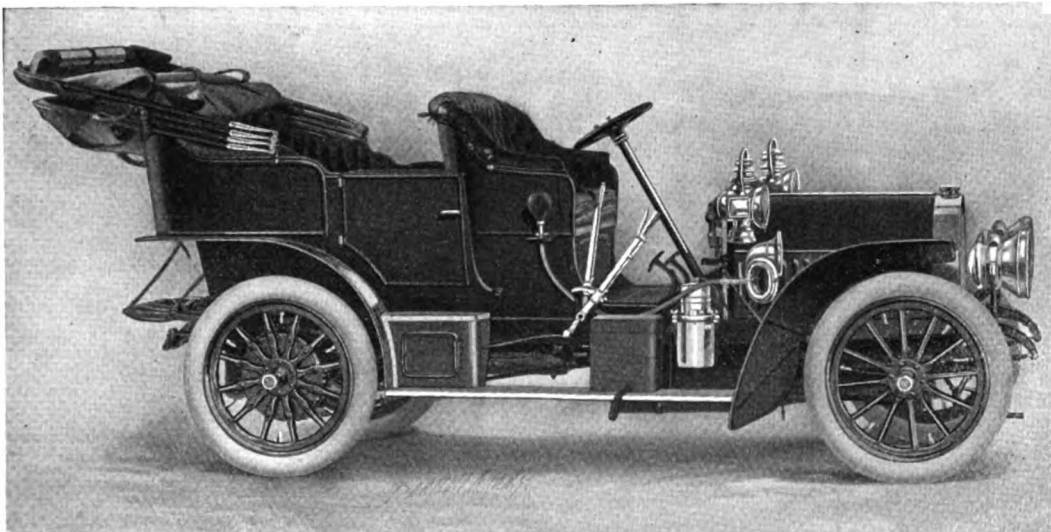
Owes its superiority to merit alone. It is the best car because it contains all the really great features that have been developed on either side of the ocean

The triumphant result of combining French and American engineering ability with the finest constructive skill of this country

Shall we send you full literature concerning this world famous car?

**THE E. R. THOMAS MOTOR CO., 1414 Niagara St.,
BUFFALO, N. Y.**

Members Association Licensed Automobile Manufacturers.



Locomobile Model "H" 30-35 H.P.

Appeals to the automobilist of experience who has had indifferent success with cheaper cars. Our new catalogue omits generalities. Contains the specific information desired by the purchaser. Mailed on request.

SPECIFICATIONS OF MODEL "H," 30-35 H. P., \$5,000

BODY—Double side entrance, seating five to seven; extra wide doors; fitted with top irons; color optional.
MOTOR—Four cylinder, 4½ inch bore, 5½ inch stroke.
CAMSHAFTS—Hardened forgings; all cams integral.
CRANKSHAFT—Machined from one solid forging.
LUBRICATOR—Large, mechanical lubricator.
CARBURETOR—Automatic, with balanced throttle valve.
GOVERNOR—Centrifugal, prompt and positive in action.
IGNITION—Make and break, iridium contacts.
MAGNETO—Low tension.
ALUMINUM PAN—Is placed underneath the machinery.
FRONT FENDERS—Have inner wings extending to bonnet.

CLUTCH—Cone type, with ample surface.
TRANSMISSION—Three forward speeds and reverse.
DRIVE—Double side chains.
UNIVERSAL JOINT—Between clutch and transmission.
RUNNING BRAKE—4 inches by 12 inches, metal to metal surfaces.
EMERGENCY BRAKES—Internal expansion, metal to metal.
SPROCKET DRUM—Bolted to each rear wheel spoke.
AXLES—"T" section axles, front and rear.
RUNNING BOARDS—Rubber covered and brass bound.
TIRES—34x4½ inches.
WHEELBASE—106 inches.
CONTROL—Spark and gas levers on steering wheel.
Top and Luggage Carrier Extra.

The Locomobile Co. of America, Bridgeport, Conn.

NEW YORK, B'way and 76th St. Member Association of Licensed Automobile Manufacturers.
PHILADELPHIA, 249 N. Broad St.

BOSTON, 15 Berkeley St.
CHICAGO, 1354 Michigan Ave.

How to Own an Automobile, or Start in the Motor Car Business on a Small Investment

There are, no doubt, many prospective automobilists throughout the country, who want to own a car for either pleasure or business reasons, who would be satisfied with an automobile smaller than the expensive ones, provided it possessed the advantage of *speed, simplicity, durability and economy.*

The **ORIENT BUCKBOARD** meets all these requirements, consequently it has a host of friends in all parts of the United States. It is a car good for the man who wants to hunt; good for the man who wants to run to his country club; good for the man who lives out of town, to go to and from the station; for the merchant who uses it for commercial purposes; for the tourist who wants to go the greatest number of miles at the smallest cost; for the rural mail carrier; for the Trouble Men of the Telephone, Telegraph, and Electric Lighting Companies, and for the dealer who wants to get into the automobile business in the most economical and satisfactory way.

One of the reasons that the **ORIENT BUCKBOARD** is able to do seemingly impossible things, is owing to the fact that it has a frictional drive transmission which gives the maximum driving power of 40 to 1, which is double that of the ordinary gear transmission. This form of construction is such that it is possible to drive the **BUCKBOARD** up grades, and also through sand and mud which are impossible to other cars.

It is a wonderful little car, and has many advantages not found in other cars, not the least of which is its moderate price.

The following is an extract from the *Chicago Daily Republican* of May 22, 1905:



"The Orient Buckboard carried two persons, weighing 350 pounds, and never stopped on hills or in the bad roads, and there were three or four notable examples. Yet we went a good deal better in the streets, where it was bad, than some big cars that went along at the same time. The Orient Buckboard is easily controlled, and requires but a few minutes' instruction to master it. Not more than three to five gallons of gasoline are required for 100 miles, which is small expense. It is the original air-cooled motor, and free from any complicated parts. In fact, it is simplicity itself. Its price, \$400.00, is but a little more than a high-grade bicycle formerly cost. For commercial purposes, to be used in the delivery of goods, a small box is attached to the rear of the seat. In that, anything can be safely carried, better, quicker and cheaper than any other mode. It is just the thing for grocers, milk dealers, meat markets and small stores of all kinds. It is not like a horse, that requires a rest once a week, for it is just as strong on the last mile as on the first. So far, we have only considered the Orient Buckboard for commercial uses, but it is an admirable pleasure vehicle as well."

From the above, it is evident that the **ORIENT BUCKBOARD** is suitable for every purpose, and is the car for the agent to handle who wants to get experience in the automobile business, without going to great expense, and is the car for the man who wants an automobile which will take him anywhere, at all times of the year, but is not expensive to house or maintain.

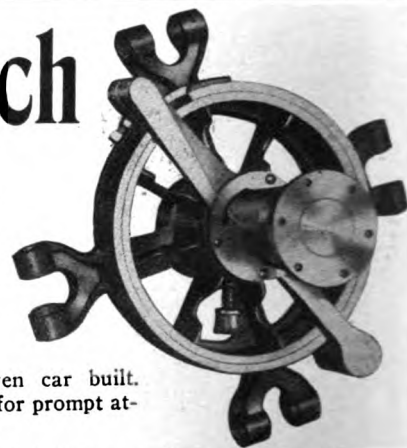
HAYNES Master Clutch

In the HAYNES Master Clutch a cam controlled by a foot lever constricts a band which is keyed to the transmission shaft, on the face of a 10 1/4-inch pulley, the four forked arms of which extend to the inner rim of the flywheel, on which are cast four lugs, one resting between each fork. Very stiff coil springs are fitted one on each side between the lugs and the forks. The stiff coil springs effectually cushion the transmission, driving mechanism and all keys from the shocks and racking effect caused by the sudden application of high power, and greatly prolong the life of the entire machine.

The operator can "pick up" the car without a jar or tremor; a sudden jerk, as is common with the cone and several other types of clutches, being impossible.

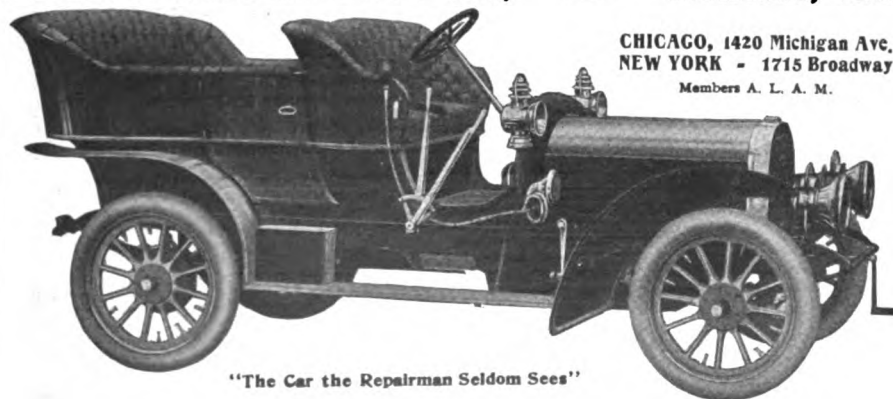
The HAYNES is the highest-powered shaft-driven car built.

In requesting Catalogue, for prompt attention address Desk C 20.



HAYNES AUTOMOBILE CO., Kokomo, Ind.

CHICAGO, 1420 Michigan Ave.
NEW YORK - 1715 Broadway
Members A. L. A. M.



"The Car the Repairman Seldom Sees"

Model "R" Four-Cylinder Touring Car. Vertical roller-bearing engine. Cylinders cast separately, 5 1/4 x 5 inches, 50 H.P. An exclusive transmission that absolutely prevents stripping of gears. Positive cooling system. Individual and special lubrication. Master Clutch has metal faces and takes hold without jerking. Shaft drive. Exclusive universal joints that prevent wear on pins. Sprocket and Roller Pinion and perfect Rear Axle, all exclusive. Roller bearings throughout. 104-inch wheelbase, 54-inch tonneau, seating five people. Four to 60 miles an hour on high gear. Weight, 2,750 pounds. Price, \$3,500 f. o. b. Kokomo. Full equipment.

Model "O" Four-Cylinder Touring Car. Cylinders cast in pairs 4 1/4 x 5 in., 25 to 28 H. P. Transmission, cooling system, lubrication, master clutch, shaft drive, universal joints, sprocket, roller pinion and roller bearings and body same as on Model "R." 97-inch wheelbase. 4-inch tires. Tonneau seating three persons. Four to 40 miles an hour on high speed. Price, \$2,250 f. o. b. Kokomo. Full equipment.

The Harrison

Model "B"

You want a car that comprises comfort, elegance and luxury. You want a car simple in construction, easy to operate and economically maintained. All of these features are embodied in the HARRISON SELF-STARTING MOTOR CAR. An investigation will convince you.

Price with full equipment, \$5,000.

TO AGENTS.—A limited amount of Territory is open. Send for complete specifications and descriptive matter.

HARRISON WAGON COMPANY, Grand Rapids, Mich., U. S. A.

(ESTABLISHED 1850)

Has six exclusive features and each one a labor saver.

These features tend to make the "HARRISON" eclipse all other cars. One feature in particular is, that there is no tire-some, back-breaking "cranking" with a "HARRISON"—you press a knob and the motor starts. It starts EVERY TIME.

It's up-to-date and a little beyond.

Four cylinder, 40 horsepower; Speed, 5 to 50 miles per hour.

National

WORLD'S RECORDS

For 1,000 miles and 1,094³/₁₆ miles in 24 hours

Made Nov. 17, 1905

STILL STAND UNEQUALLED



Proving
National
Superiority

WRITE FOR PARTICULARS

4 Cyl., 35-40 H.P. - \$3,000

6 Cyl., 50-60 H.P. \$4,000

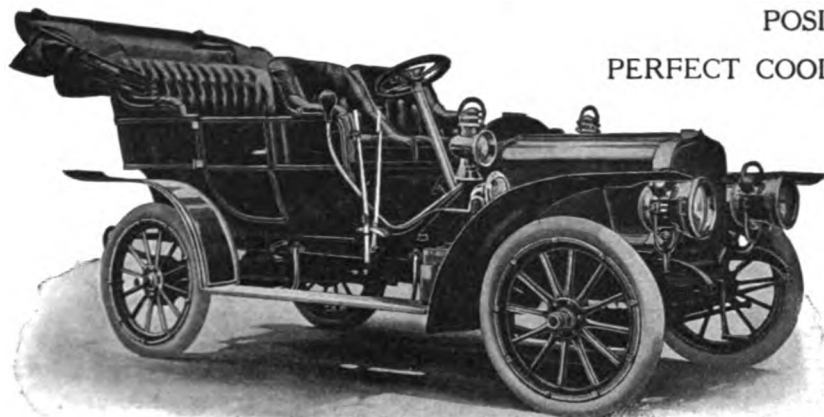
NATIONAL MOTOR VEHICLE CO.

MEMBER AMERICAN MOTOR CAR MANUFACTURERS ASSOCIATION, CHICAGO.

1000 East 22d St.
Indianapolis, Ind.

The

CORBIN



POSITIVELY RELIABLE

PERFECT COOLING ASSURED BY THE CORBIN
PATENTED SYSTEM

THE MATERIAL USED IN
CORBIN CONSTRUCTION
IS ABSOLUTELY THE
BEST OBTAINABLE, RE-
GARDLESS OF COST.

A DEMONSTRATION WILL
CONVINCE YOU OF THE
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DESIGN.

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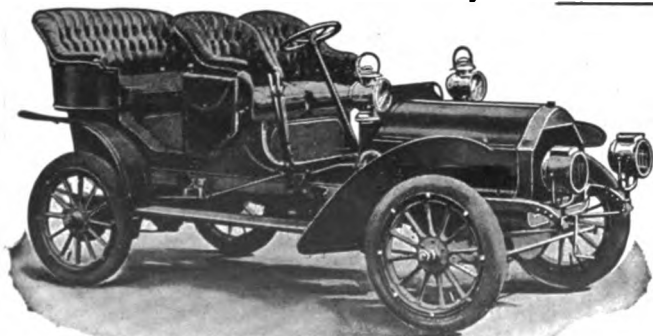
5005 Centre Avenue, Pittsburgh, Pa.
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670 Main Street, Buffalo, N. Y.
Court and Exchange Sts., Rochester, N. Y.

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12th and State Streets, Erie, Pa.
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STEVENS-DURYEA

\$2,500 TOURING CAR

If you are looking for the "best" car you can't recognize the car marks by size, speed, price, quietness, number of cylinders, where they are located, whether the car is gear driven or chain driven, or any such external s. THE car that is "best" for you is that car which will return you the most fun and enjoyment per



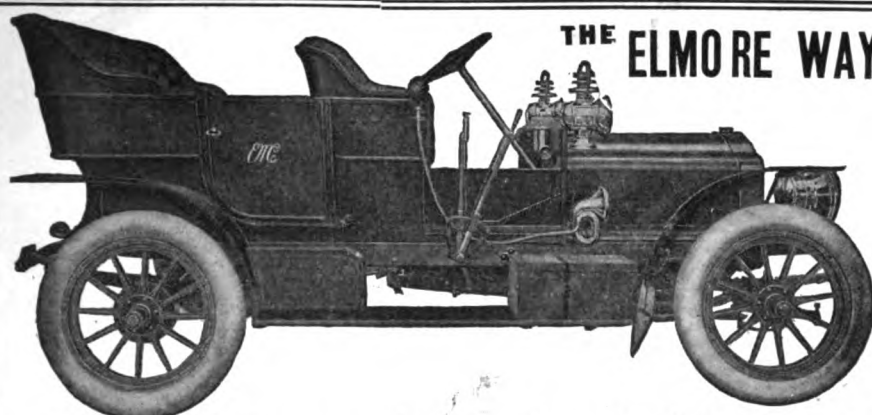
dollar expended, and which will fill your mind with the greatest number of pleasant recollections and fewest unpleasant. YOU can't determine which car that is by listening to what the makers and sellers of the various cars have to say in its favor at the beginning of the year, but what those who have purchased it have to say for or against it at the end of the year.

Our XXth Century Hustler Booklet gives a complete analytical description of our method of construction. It can be had upon request from us or any of our agents.

J. STEVENS ARMS AND TOOL CO.

900 Main Street
CHICOPEE FALLS, MASS., U. S. A.

Members Association Licensed Automobile Manufacturers.



THE ELMORE WAY

Of course you have been reading about the Elmore Two-Cycle Motor and the advantages it possesses over the ordinary four-cycle type. But do you know the essential differences between the two systems?

The terms are rather mystifying to a layman. If you were to substitute the word "stroke" for cycle, it would make the sense clearer.

It requires four strokes of the piston—two outward and two inward—to complete an impulse with the four-cycle engine.

In the Elmore two-cycle motor two strokes—one in and one out—are all that are needed.

To go a little farther, you must know that a four-cycle cylinder is made effective through the action of a pair of valves; one to allow the explosive mixture to enter the combustion chamber, and the other to let the burnt gases out later. To operate these valves exactly, some sixteen to twenty auxiliary parts are absolutely necessary, and when the engine is revolving 1,200 times a minute, each valve must be at 1-200 of a second adjustment. Any variation entails a great loss in power. Nice work, you see, even when everything goes well.

The Elmore Two-Cycle has no valves—not one small part to keep at concert pitch eternally. The explosive and burnt gases enter and leave through parts that are uncovered and covered by the piston itself.

Now you see why the Elmore is ahead all around.

Positive impulse at every outward piston stroke, as against every other stroke in the case of the four-cycle.

An equally positive valveless system to provide the gas.

No valves to bother with or replace.

Constant torque because of double the impulses possible with an equal number of four-cycle cylinders. You'll be interested in Elmore literature. What's your address?

Model 15. Four-cylinder, Two-cycle Elmore, \$2,500

THE ELMORE MFG. CO., 1304 Amanda St., CLYDE, OHIO

Members Association Licensed Automobile Manufacturers



The Maxwell



*Perfectly Simple
Simply Perfect*

WHAT DO THE OWNERS SAY ?



20 H. P. Touring Car, \$1,450

Send for our book "Facts and Testimony," which contains letters from 32 owners who enjoy telling what they know of the "Maxwell." Free to those sending for our catalogue.

Write Department 3.

MAXWELL-BRISCOE MOTOR COMPANY

Members American Motor Car Manufacturers' Association.

CHICAGO, ILL.

FACTORIES :

Main Plant : TARRYTOWN, N.Y.

PAWTUCKET, R. I.

BRANCHES.

Maxwell-Briscoe, Inc., New York, N. Y.
Maxwell-Briscoe-Chase Co., Chicago, Ill.
Fisher Automobile Co., Indianapolis, Ind.
Morrison-Tyler Motor Co., Boston, Mass.

Maxwell-Briscoe-McLeod Co., Detroit, Mich.
Maxwell Garage, Brooklyn, N. Y.
J. W. Willcox & Son, Los Angeles, Cal.
Richard Irvin & Co., New York City.

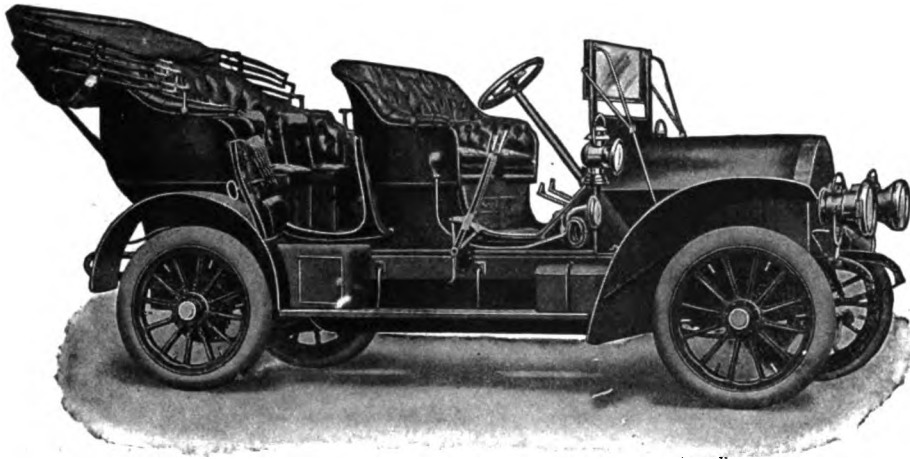


10 H. P. Tourabout, \$780

KNOX WATERLESS

Touring Car

MAKES A WORLD'S RECORD



Capacity, Seven Persons. 40 H.P.

KNOX AUTOMOBILE CO., Springfield, Mass.

Member A. L. A. M.

**New York to Boston
and return—503
miles.**

**Seven passengers
and 300 pounds bag-
gage in 19 hours
53 minutes.**

**Making the run
without a stop.**

**Highest powered air-cooled
car in the world.**

**MODEL A.
30-35 H.P.
MULTIPLE
DISC CLUTCH**

MOON

**FAST
POWERFUL
DURABLE
ECONOMICAL**

Full Equipment
Ready for Touring



**PRICE
\$3,000 f.o.b. factory
Immediate Deliveries.**

*The Best that
Brains and
Experience can
build or
Money can
buy*

*The Car
You Will
Eventually
Buy*

MOON MOTOR CAR CO.

MAIN AND CORNELIA STS. ST. LOUIS, MO.

Boston Mechanical Co., 20 Park Square Motor Mart,
Boston, Mass., New England Distributors.

Grant Square Automobile Co., 1378 Bedford Ave.,
Brooklyn, N. Y., New York and Greater N. Y. Distributors.

Central Automobile Co., 5989 Center Ave.,
Pittsburg, Pa., Western Pennsylvania Distributors.

THE MODEL F Cleveland

30-35 HORSEPOWER

5 to 55 Miles per Hour on Third Speed.

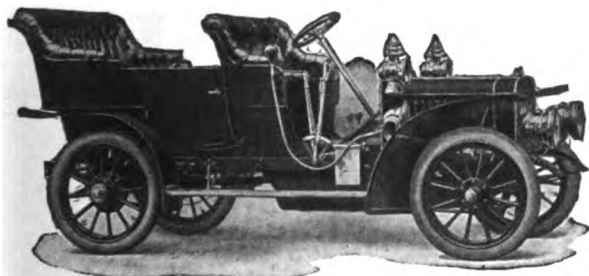
THE PRACTICAL CAR

The CLEVELAND is not made to exploit some particular mechanical point. It is put together piece by piece with the sole idea of giving unfailing service all the time.

There are no larger builders of automobile parts in this country than the GARFORD COMPANY. Yet they experimented for years before they put the CLEVELAND car on the market. They have built machines for others from the early days when there was more automobile experimenting than knowledge. But not until they knew they had a perfect part for every place was the CLEVELAND produced. Its performances since have justified the wait. In every part of the country—on good, bad and very bad roads—CLEVELAND Cars have reduced the average of repair cost to the minimum.

Do you wonder that the enthusiastic motorists who have benefited are willing to tell you just how they increased their pleasures and decreased their expenses by driving a CLEVELAND—the practical car?

Write us for particulars.



Showing the Cleveland Model F, Equipped with the Double Tulp Body. Price, \$3,500.

SPECIFICATIONS.

4-cylinder, 30-35 H.P.
Imported Simms-Bosch magneto automatic make-and-break spark.
Direct drive, nickel steel I-beam front axle.
34x4-inch wheels, ball bearings.
Wheelbase, 104 inches.
Simplest control, 5 to 55 miles on high gear.
Absolutely noiseless.
Body option, Victoria or Tulp, as illustrated.

PRICE \$3,500 TO \$5,000

depending on body equipment. Guaranteed for one year.
(Catalogue and full information on request.)

CLEVELAND MOTOR CAR CO.

Dept. 3, CLEVELAND, OHIO.

NEW YORK—E. B. Gallaher, 228-30 West 58th Street,
General Eastern Distributing Agent.

BOSTON—Butler Motor Co., 998 Boylston St.
PHILADELPHIA—Diamond Motor Car Co., 2118-20 N. Broad St.
PITTSBURGH—Colonial Automobile Co.
BUFFALO—Cleveland Cycle and Auto Co., 649 Main St.
CHICAGO—Casidy-Fairbanks Co., 1413 Michigan Ave.
ST. LOUIS—St. Louis Automobile Co., 3685 Olive St.
KANSAS CITY, MO.—O'Belme & Co., 1737 Grand St.
SO. CALIFORNIA—A. P. Worthington, 4th & Los Angeles Sts., Los Angeles, Cal.
NO. CALIFORNIA—J. W. Leavitt & Co., 309 Larkin St., San Francisco, Cal.



Just Imported

¶ The Rossel Car can be purchased in this country this season for the *first* time in its history. So keen has been the demand for it in the exclusive motoring circles of Paris and London, that the sales abroad for future delivery have been up to the full capacity of the factory.

¶ This demand is entirely due to the wonderful performance of the Rossel Car, not alone in races, speed trials, etc., but in the hands of private owners who drive their own cars.

¶ Quiet, smooth running, with a minimum of vibration; easy to control, flexible, swift and reliable (embodying all the best features of the advanced 1907 Models), the Rossel Car, built by the most skilled mechanics of France, is a marvel of perfection.

FOUR { 22-26 H.P.; 28-35 H.P.;
TYPES { 40-50 H.P.; 50-65 H.P.

FOR IMMEDIATE DELIVERY

One 28-35 H.P. Touring Limousine (seating capacity eight persons).

Also one 28-35 H.P. Touring Car (seating capacity seven persons).

Catalogue and demonstration on request.

The Rossel Company of America

Knickerbocker Building :: 39th Street and Broadway
Tel., 4348-38th New York City

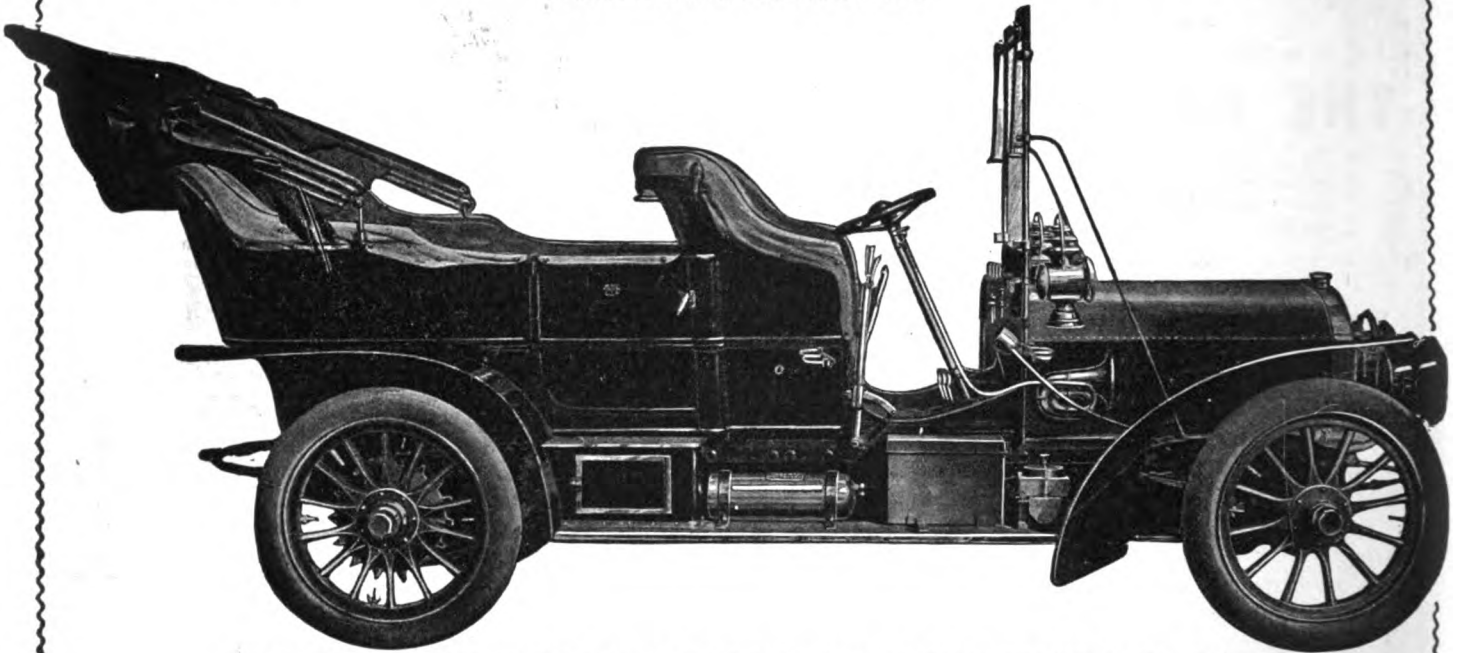
Sole Agents in U. S. and Canada for F. Rossel & Co's cars.

CHROME NICKEL STEEL
used throughout in construction of shafts, transmission and gears.

“Matheson”

LICENSED UNDER SELDEN PATENT.

MESS-BRIGHT IMPORTED
ball-bearings secure perfect transmission of power from engine to wheel.

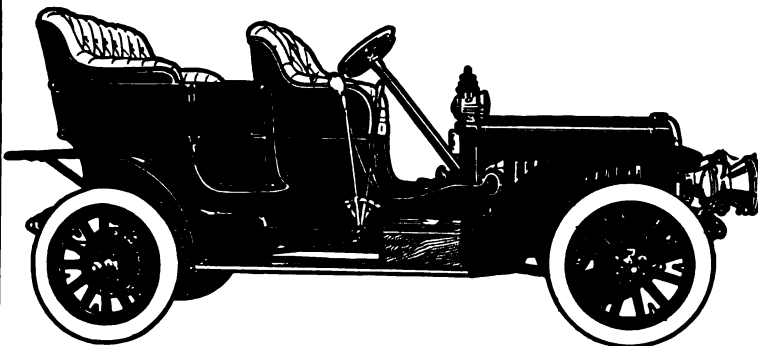


THE MATHESON COMPANY OF NEW YORK

FACTORY, WILKES-BARRE, PA.

1619 Broadway, near 49th Street

CATALOGUE ON REQUEST



Model 15, 35-40 Horsepower. Price, \$2,500.

Rambler

**THE CAR OF POWER,
SPEED AND COMFORT**

This car, the leader of the Rambler line, has repeatedly beaten cars much higher in price and rated power.

As a hill climber it is without a peer, and plows through mud and sand with little decrease in speed and no discomfort to the passengers.

Every ounce of material is especially selected and submitted to rigid tests, and the design and workmanship is such that it will withstand the most trying service without tinkering and adjustment.

IT IS A CAR OF THE ROAD AND NOT THE REPAIR SHOP, which assures the minimum cost of maintenance. Your inspection is invited, as we are anxious to "show you."

THOMAS B. JEFFERY & COMPANY
Main Office and Factory KENOSHA, WISCONSIN

BRANCHES

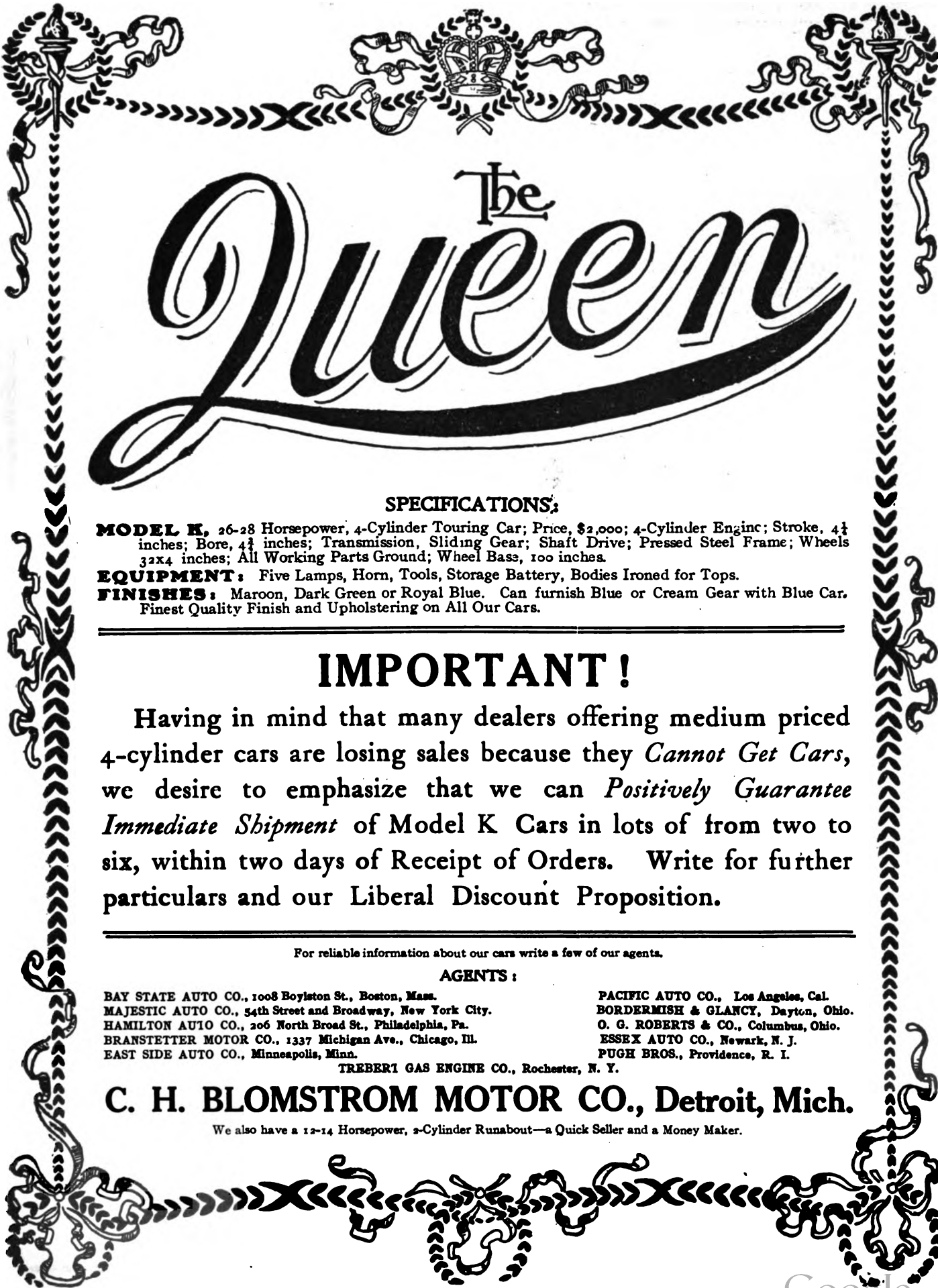
CHICAGO, 302-304 Wabash Ave.
BOSTON, 145 Columbus Ave.

SAN FRANCISCO, 31 Sanchez St.

MILWAUKEE, 457-459 Broadway
PHILADELPHIA, 242 No. Broad St.

NEW YORK AGENCY, 38-40 West 62d St.,

REPRESENTATIVES IN ALL LEADING CITIES



The Queen

SPECIFICATIONS:

MODEL K, 26-28 Horsepower, 4-Cylinder Touring Car; Price, \$2,000; 4-Cylinder Engine; Stroke, 4½ inches; Bore, 4½ inches; Transmission, Sliding Gear; Shaft Drive; Pressed Steel Frame; Wheels 32x4 inches; All Working Parts Ground; Wheel Base, 100 inches.

EQUIPMENT: Five Lamps, Horn, Tools, Storage Battery, Bodies Ironed for Tops.

FINISHES: Maroon, Dark Green or Royal Blue. Can furnish Blue or Cream Gear with Blue Car. Finest Quality Finish and Upholstering on All Our Cars.

IMPORTANT!

Having in mind that many dealers offering medium priced 4-cylinder cars are losing sales because they *Cannot Get Cars*, we desire to emphasize that we can *Positively Guarantee Immediate Shipment* of Model K Cars in lots of from two to six, within two days of Receipt of Orders. Write for further particulars and our Liberal Discount Proposition.

For reliable information about our cars write a few of our agents.

AGENTS:

BAY STATE AUTO CO., 1008 Boylston St., Boston, Mass.
MAJESTIC AUTO CO., 54th Street and Broadway, New York City.
HAMILTON AUTO CO., 206 North Broad St., Philadelphia, Pa.
BRANSTETTER MOTOR CO., 1337 Michigan Ave., Chicago, Ill.
EAST SIDE AUTO CO., Minneapolis, Minn.

PACIFIC AUTO CO., Los Angeles, Cal.
BORDERMISH & GLANCY, Dayton, Ohio.
O. G. ROBERTS & CO., Columbus, Ohio.
ESSEX AUTO CO., Newark, N. J.
PUGH BROS., Providence, R. I.

TREBERTI GAS ENGINE CO., Rochester, N. Y.

C. H. BLOMSTROM MOTOR CO., Detroit, Mich.

We also have a 12-14 Horsepower, 2-Cylinder Runabout—a Quick Seller and a Money Maker.

Kansas City Motor Car Co.

6-Cylinder

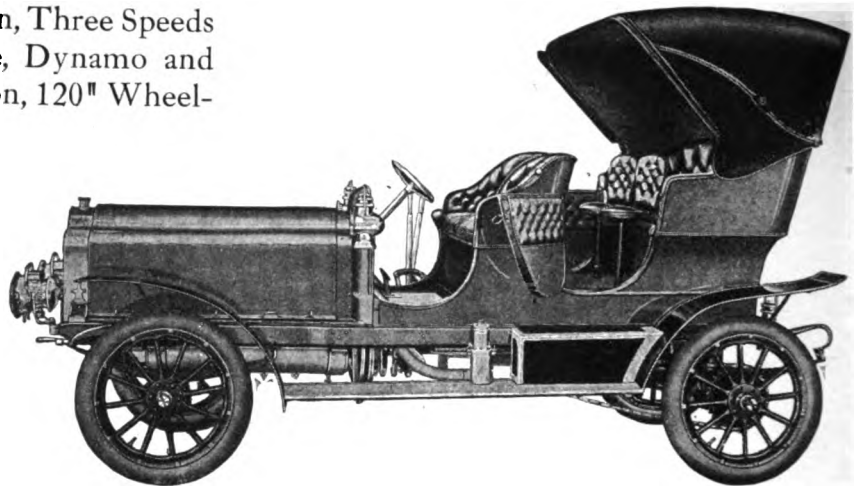
75-Horsepower

7-Passenger

TOURING CAR

Sliding Gear Transmission, Three Speeds
Forward and one reverse, Dynamo and
Storage Battery for ignition, 120" Wheel-
base, Mounted on
36 x 4" Wheels Front,
and 36 x 4½" Rear.

Full and Complete
Equipment with Vic-
toria Top, \$4,500.



COMMERCIAL VEHICLES



Capacity, from 1 ton to
10 tons; 4-cylinder hori-
zontal motors of 30, 50
and 60 H.P.; sliding gear
transmission, side chain
drive; starts from seat.

Some of the recent con-
tracts placed with us after
purchasers had used other
makes of Trucks and had care-
fully investigated the equip-
ment manufactured by us:

Standard Oil Co., Sears
Roebuck & Co., Cable Piano
Co., Spielman Bros., M.
O'Brien & Son, all of Chicago;
Deere & Mansur Co., Moline,
Ill.; John Leslie Paper Co.,
Minneapolis; Continental
Caoutchouc Co., New York,
N. Y.

ADDRESS

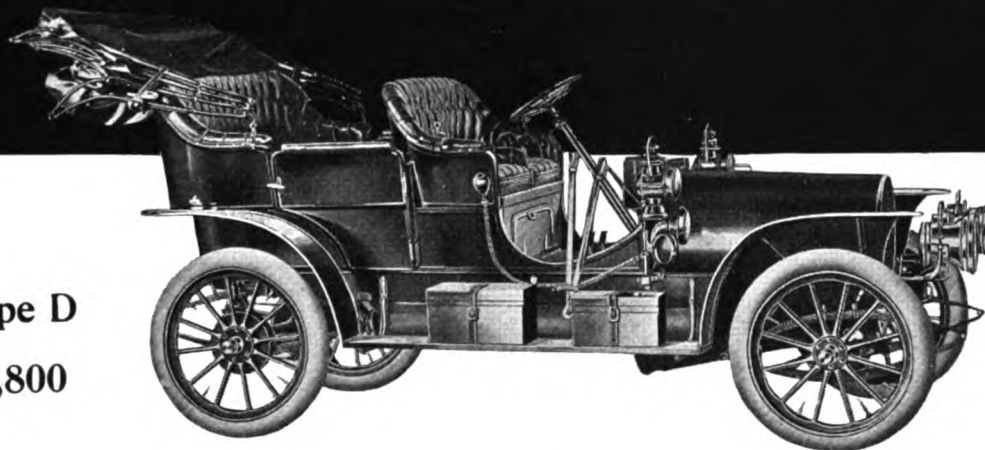
KANSAS CITY MOTOR CAR CO.

General Office 310 West 9th St.,

Kansas City, Mo.

1902 | 1906
 We sold 13 cars | Our sales rank second
What's the conclusion?

Type D
 \$2,800



45 miles
 an hour
 1,800 lbs.

Four years ago we built the first American air-cooled car. And nearly every maker said air-cooling was "impossible." Now many of the same makers are making air-cooled cars, and an air-cooled Franklin holds the world's long-distance touring record, endurance record and efficiency record. What's the reason?

Four years ago we built the first American 4-cylinder car. Nearly everybody said 4-cylinders were a mistake. Now almost every manufacturer has adopted 4-cylinders. They are universally recognized as correct engineering. A 4-cylinder Franklin in the Automobile Club of America's great efficiency contest won the First Prize and went farther on 2 gallons of gasoline than any automobile—except a buckboard—ever went in the world. And we are building and selling twice as many 4-cylinder cars as any other American maker. What's the reason?

Four years ago we made only 13 Franklin cars, and nearly everybody—except their users—said they must be all

wrong. This year our sales rank third, in amount of money, and second in number among all American cars. What's the conclusion?

We have always claimed that Franklin air-cooled engineering and strong, light-weight, non-jarring construction—produces and utilizes power and makes it comfortably available to a degree impossible in any other car. And because of these principles Type D, shown above, does more for the money than any other car, does as much as the highest-priced heavy water-cooled car at any price, and is easier-riding than any car in the world except a Franklin.

Doesn't the record indicate that these claims are worth investigating?

Ask any Franklin dealer. Or write for the book.

Four-cylinder Runabout, \$1,400

Shaft-driven Runabout, \$1,650

Four-cylinder Light Touring-car, \$1,800

Four-cylinder Touring-car, \$2,800

Six-cylinder Touring-car, \$4,000

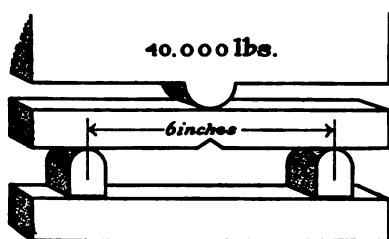
f. o. b. Syracuse.

H. H. FRANKLIN MFG. CO., Syracuse, N. Y., M. A. L. A. M.

SIMPLEX

Nickel Chrome Steel

Actual Test



A notched bar of Simplex Nickel Chrome Steel (one inch square) placed on abutments six inches apart is not noticeably affected under a weight of 40,000 lbs.

A bar of ordinary Nickel Chrome Steel (same thickness) fractures at this test.

SINCE we demonstrated in our 30 H. P., S. & M. SIMPLEX TOURING CAR, the superiority of Nickel Chrome Steel for crankshafts, front axles, transmission gears and differential shafts many makers now claim to use the same steel as we do.

But quality varies in steel, as in other commodities. To get the best it is necessary to pay the price. The figures that many cars are offered at preclude the idea of employing the best nickel chrome steel in their construction.

To illustrate the superior strength and quality of Simplex Nickel Chrome Steel over the ordinary grades of this metal we present the results of a series of practical tests and believe in this case figures will prove more convincing than arguments.

The high quality of material used in the construction of the S. & M. Simplex car is the foundation of its strength and reliability. We have other distinctive points of excellence to present at another time.

Nickel Chrome Steel	Simplex	Ordinary
Tensile Strength . . .	232,400 lbs.	118,000 lbs.
Elastic limit	223,200 lbs.	82,000 lbs.
Elongation	12 per cent.	10½ per cent.
Contraction	42 " "	28 " "

Smith & Mabley

(Incorporated)

Broadway, 56th-57th Streets,

New York

MEMBERS ASSOCIATION LICENSED AUTOMOBILE MANUFACTURERS

Philadelphia:—Smith & Mabley, of Pennsylvania-Bellevue-Stratford

Chicago:—Hamilton Automobile Co.—1251 Michigan Ave.

WINTON MODEL-K



Mr. and Mrs. D. P. Duffie and Sons, of Staten Island, in their Winton Model K

Mr. and Mrs. D. P. Duffie, of West New Brighton, Staten Island, have probably secured as much enjoyment from motoring as anybody in America. Mr. Duffie was a pioneer user, having owned a Winton phaeton in 1899, and since that time he has always had at least one motor car in service at his magnificent Staten Island home. The Winton Model K, shown in the illustration, is his sixth Winton, his intermediate purchases having been cars made by this company in 1900, 1901, 1902 and 1905.

Must be some reason why Mr. Duffie has used Wintons year after year, despite the inducements to change, offered him by energetic salesmen.

The only answer is that he has yet to see any car that could give better all around service.

Just Compare the \$2,500 Winton with Any Car on the Market Selling at \$3,500 or Higher

"The Motor Car Dissected" tells the details. Mention this paper and get a copy from

The WINTON MOTOR CARRIAGE CO.

Licensed under Selden Patent.

Cleveland, O., U. S. A.

Winton Branch Houses in New York, Boston, Philadelphia, Chicago, Pittsburg and London

Winton Sales Agencies in all important places.

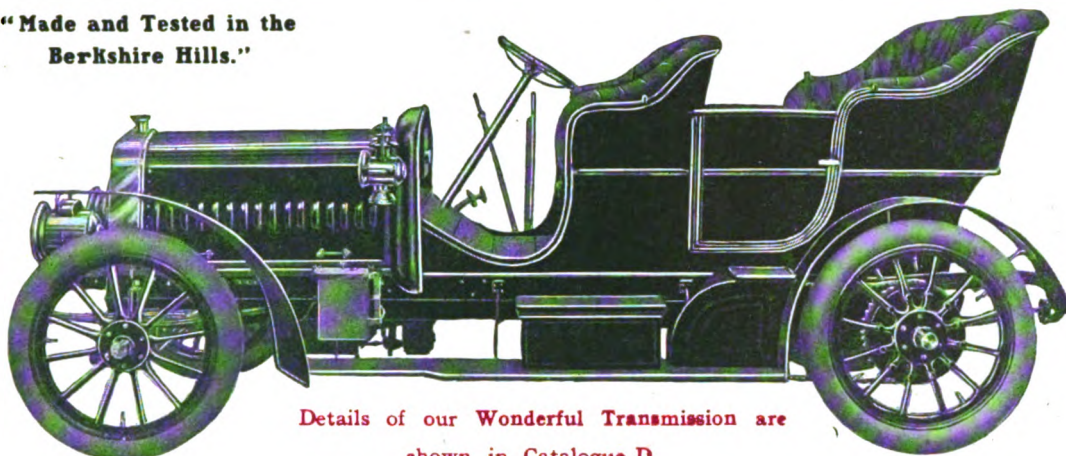
BERKSHIRE

HIGH CLASS

TOURING CARS

"Made and Tested in the
Berkshire Hills."

24 H.P.
\$2,500



35 H.P.
\$3,000

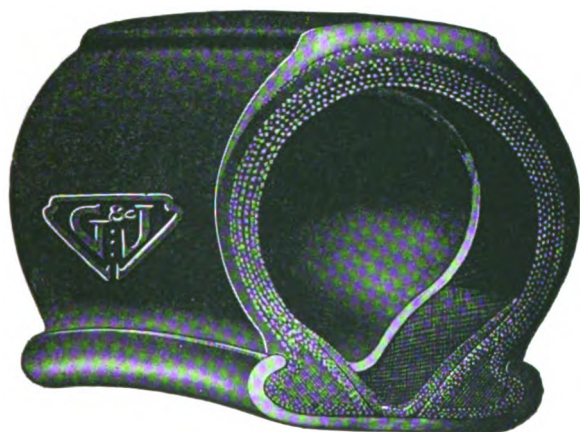
Details of our Wonderful Transmission are
shown in Catalogue D

BERKSHIRE AUTOMOBILE COMPANY

New York Agency,
1623 BROADWAY

General Offices and Factory: Pittsfield, Mass., U. S. A.

Boston Agency,
8 MOTOR MART



Rims branded in the channel with this
Copyrighted mark have been inspected
and pronounced perfect. We guar-
antee our tires only on rims so branded.

G & J Motor Car Tires

Made in the shape they assume in
service, relieving strain on the fabric.

NO LOOSE COVERS

Fitted with a flap, giving a perfect
seating for the inner tube.

NO PINCHED TUBES

Made with a raised tread, giving
added wearing surface.

Why not buy THE BEST TIRES when they cost no more than others?

G & J TIRE CO.

INDIANAPOLIS.

DEPOTS: Chicago, Detroit, Boston, Buffalo, Cleveland, Philadelphia, Denver, and 401 Twelfth Street, Oakland, Cal.
New York, 10 W. 60th Street.

DISTRIBUTING AGENTS: Minneapolis, Plant Bros. Portland, Ore., Keats & Co. Los Angeles, Ramsey-Hutchins Rubber Co.

ATWOOD

The great care and attention given to the smallest detail; the immediate adoption of every improvement in methods of manufacture, and the introduction of new devices not elsewhere employed, have resulted in the production of the highest standard in design and workmanship at prices that are very favorable.

Our immense factory and extra facilities are such that we can guarantee

IMMEDIATE DELIVERIES

Our thirty-five years' experience in making high-grade lamps is shown in the product—the finest ever.

ATWOOD MANUFACTURING CO.

"ATWOOD" Lamps
are the best made in America

AMESBURY, MASS.

LAMPS

new for here. 'e' must be broad to the

UNIVERSITY OF MICHIGAN



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